AN ANALYSIS OF THE INFLUENCES ON APPLETON EAST HIGH SCHOOL TECHNOLOGY EDUCATION STUDENTS' PERCEPTION OF THE CONSTRUCTION INDUSTRY

by

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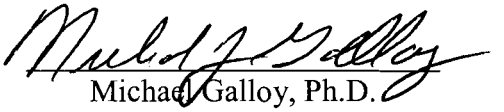

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ABSTRACT

The Bureau of Labor has indicated that by the year 2012 there will be a need for one million skilled construction workers to fill industry demands (cited in Carr, 2005; Heffner, 2005; Reese, 2005; "Unprecedented growth", 2004). It is estimated that Wisconsin's construction industry employment will grow to 99,450 by the year 2012, which is a 20% increase when compared to 2002 employment statistics (Hot jobs: Wisconsin statewide, n.d.). The construction industry is facing a major workforce shortage crisis and a contributing factor to this shortage stems from high school graduates showing disinterest in construction occupations (Carr, 2005). Post graduate surveys administered by Appleton East High School revealed that a mere 24 of the 1747 graduates (1.3%), from the classes of 2001 through 2005, have chosen a career in the construction industry.

The purpose of this study is to determine what factors are influencing Appleton East High School students' perception of construction-related occupations. This study reveals student perceptions of the construction industry through the use of a survey created by the researcher. The participants of this study are males and females, grades 9 through 12, enrolled in Technology Education classes during the spring semester of the 2005-06 calendar school year.

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Chapter I

Introduction to the Study

Introduction

Construction is a high-growth industry that is critical to the U.S. economic viability and development with 4.8 percent of the Gross Domestic Product and significant projected growth (Heffner, 2005). It is estimated by the Department of Labor's Bureau of Labor Statistics that it will take a quarter of a million new workers each year to keep the construction trades growing (cited in Gibbs, 2005). In another report, the Bureau of Labor indicated that by the year 2012 there will be a need for one million skilled construction workers to fill industry demands (cited in Carr, 2005; Heffner, 2005; Reese, 2005; "Unprecedented growth", 2004). With employment expected to reach 7.8 million by 2012, the construction industry is predicted to be among the economy's top 10 largest sources of job growth (Heffner, 2005). These reports indicate that the construction industry has a high demand for skilled workers. One of the known causes for this increased demand in construction occupations is a result of worker retirements (Carr, 2005; Gibbs, 2005). Another underlying cause is that younger workers are disinterested in construction-related careers due to negative perceptions (Carr, 2005).

In comparison to the national average, it is estimated that Wisconsin's construction industry employment will grow to 99,450 by the year 2012, which is a 20% increase when compared to 2002 employment statistics. It is also estimated that there will be 32,350 job openings from 2002 to 2012. These projected statistics reveal that construction occupations will be the third largest source of job growth in Wisconsin between the years of 2002 and 2012. Only information technology and health care-related occupations are projected to grow faster (Hot jobs: Wisconsin statewide, n.d.).

Construction occupations are also in high demand in Wisconsin's Fox Valley and Green Bay regions. In the Wisconsin Fox Valley region, it is estimated that construction industry employment will grow to 8350 by the year 2012, which is a 24% increase from 2002 employment statistics (Hot jobs: Wisconsin Fox Valley, n.d.). It is also projected that construction industry employment in the Wisconsin Green Bay region will grow to 12,320 by the year 2012, which is a 21% increase from 2002 employment statistics (Hot jobs: Wisconsin Bay area, n.d.). These projections rank construction occupations as the second fastest growing occupation in the Wisconsin Fox Valley region and the third fastest in the Wisconsin Green Bay region (Hot jobs: Wisconsin Bay area, n.d.; Hot jobs: Wisconsin Fox Valley, n.d.).

To meet the construction employment needs of these two regions, the Appleton Area School District offers construction-focused courses at all three high schools. Appleton East High School, Appleton West High School, and Appleton North High School provide students with the option of enrolling in three construction-related courses, which include: Residential House Construction, Construction Techniques, and Carpentry and Wiring. These courses are designed to expose students to careers in construction. Though these courses provide students with relevant knowledge and skills that are necessary in the construction industry, enrollment has decreased. Appleton East alone had a mere 24 students enroll in the above mentioned construction courses for the 2005-2006 school year. In return, there was a minimal amount of students who chose a career in the construction industry.

A negative result of low enrollment in secondary Career and Technical Education (CTE) courses is the termination of courses, programs, and instructors. Occupational employment statistics for the state of Wisconsin indicate that there were 2960 secondary CTE instructors employed in the year 2000. Within four years the number of secondary CTE instructors

employed in the state of Wisconsin dropped to 1770, a 40% reduction. The number of CTE instructors in the Wisconsin Fox Valley region has also been negatively impacted. Occupational employment statistics for the Wisconsin Fox Valley region indicate that there were 220 secondary CTE instructors employed in the year 2000 and in 2004 that number had dropped to 120, a 45% decrease ("Occupation employment statistics query results", 2004). The variables for these job losses are not specifically indicated in the occupational employment statistics reports. However, secondary CTE courses are elective classes and low enrollment is one variable that can have a major impact on the decision to discontinue a CTE course, program, or position.

With a high demand for skilled construction workers, why aren't more high school students enrolling in CTE courses that relate to the construction trades? The reality is that many high school students have a negative image of construction-related occupations and view them as menial, low paying jobs that are below their standards (Gibbs, 2005). Unsafe working conditions is another negative aspect of the construction industry, although measures have been added in the past 20 years to provide education for workers on the topics of dangerous materials and practices (Tibbets, 2002).

The solution to changing this perspective should not be the sole burden of CTE programs. Companies must take a vested interest in education as well. Companies within the construction industry may need to step up their roles in education both in support of traditional educational institutions and directly as educators ("Industry's future", 2005). In addition to company investment, CTE programs must also ensure that they work in conjunction with the construction industry and change as quickly as the economy they intend to support (Cutshall, 2003).

Problem Statement

There are an increasing amount of construction-related occupations available, but there are less Appleton East High School students taking interest in the construction industry to supplement this worker shortage. If CTE instructors and companies within the construction industry fail to develop methods to increase student interest in construction-related occupations, it may cause a further decline in the number of CTE construction-centered programs offered at Appleton East High School, as well as many other CTE programs throughout Wisconsin. In return, the construction industry may be supplied with less skilled workers, potentially causing a decline in production, quality, and/or safety.

Purpose of the Study

The purpose of this study is to determine what factors are influencing Appleton East High School Technology Education students' perception of construction-related occupations. Data was collected from Appleton East High School Technology Education students through the utilization of a voluntary survey during the spring semester of 2006.

Research Questions

This study will provide answers to the following questions:

1. Is enrollment in construction-related courses a factor that influences student perceptions of construction occupations?

2. Are student perceptions of construction- related courses influenced by the construction teacher?

3. Does occupational safety influence student perceptions of construction occupations?

4. Do family influences affect student perceptions of construction occupations?

5. Is gender a factor that affects student perceptions of construction occupations?

6. Does grade level influence student perceptions of construction occupations?

7. Do guidance counselors influence student perceptions of construction occupations?

Significance of the Study

The number of students enrolling in construction-related courses within Appleton East High School has declined and no research has been completed to determine the cause. This study will determine what influences are causing Appleton East High School students to develop negative perceptions of the construction industry. The results of this study are significant to multiple groups within CTE and the construction industry.

1. Completing this study will be beneficial towards strengthening the CTE construction programs offered at Appleton East High School. Construction certified CTE instructors will have the opportunity to use the results of this study to make any adjustments necessary to effectively market their construction programs and increase student awareness of the positive career possibilities available in the construction industry.

2. Career and Technical Education instructors will be afforded the opportunity to communicate with construction industry members by sharing the results of this study with local construction companies. Through communication, CTE instructors and construction companies will be able to collaborate on creating a positive image of the construction industry to reverse the negative perceptions held by high school students.

Limitations of the Study

The following limitations for this study are as follows:

1. The amount of surveys to be completed and returned by high school level CTE students may have a low return rate due to the voluntary nature of the study.

2. This study uses a survey that was created by the researcher and may contain unintentional human errors. These errors may negatively affect the validity or return rate.

3. Student surveys are limited to Appleton East High School, which is located within the Appleton Area School District. Therefore, the results of the student surveys may not be true of all Wisconsin high schools.

4. Construction industry input into the survey content will only be derived from the Wisconsin Fox Valley region and may not relate to other construction companies outside of this sampling area. This may reduce the relevancy or appropriateness of this study for constituents outside of the Wisconsin Fox Valley region.

5. Surveys will be administered at the end of the academic school year, which could affect the number of returned surveys, in addition to the amount of time and consideration the subjects use to complete the survey. Students who are surveyed at the end of the year may have changed their perspective of the construction industry over the duration of the school year. This could possibly alter the validity of student feedback, because initial perceptions of the construction industry may or may not have been affected.

Definition of Terms

The following terms are defined for clarity of understanding for this study. Unless otherwise cited, the following definitions were obtained from Merriam-Webster Online (Merriam-Webster online, n.d.).

Apprenticeship: a **:** one bound by indenture to serve another for a prescribed period with a view to learning an art or trade b **:** one who is learning by practical experience under skilled workers a trade, art, or calling.

Career Academy: a four-year high school with a career and technical focus (Clyde C. Miller Career Academy, n.d.,¶1).

Career and Technical Education: known as vocational education; comprehensive high schools, vocational and technical high schools, area vocational centers, and community colleges offer vocational education programs (Office of Vocational and Adult Education, 2006).

Construction: to make or form by combining or arranging parts or elements.

Gross Domestic Product: the gross national product excluding the value of net income earned abroad.

Information Technology: the development, installation, and implementation of computer systems and applications (Ask Jeeves, n.d.).

Secondary school: a school intermediate between elementary school and college and usually offering general, technical, vocational, or college-preparatory courses.

Tech Prep: cooperation among the technical colleges, secondary schools, universities, business, labor, and the community working together to design educational programs that enhance student learning by incorporating real-world application of knowledge and skills into teaching and learning ("Advanced standing credit", 2001).

Trade: an occupation requiring manual or mechanical skill.

Viable: financially sustainable.

Chapter II

Review of Literature

Introduction

This chapter reviews literary sources which discuss the workforce shortage within the construction industry and why there are a dwindling number of high school students choosing the construction industry as a viable career. There is a minimal amount of literature that explicitly discusses high school students' perceptions of the construction industry, therefore this review of literature will focus on two variables, the construction industry and high school students. This chapter will highlight the following: 1) national view of the construction industry's workforce shortage, 2) increasing student awareness of the construction industry, 3) construction in Wisconsin's Fox Valley Region and 4) post graduation occupation selection by Appleton East High School students.

National view of the construction industry's workforce shortage

The U.S. Bureau of Labor Statistics indicated that the construction industry is projected to be one of the nation's fastest growing industries, adding nearly one million new workers by the year 2012 (cited in Carr, 2005; Heffner, 2005; Reese, 2005; "Unprecedented growth," 2004). This projection portrays a positive image, however there is an underlying problem causing concern across the construction industry. This concern pertains to the workforce shortage crisis the construction industry is currently facing. The source of this problem is a result of industry growth combined with worker retirements from the baby boomer generation, unskilled or unqualified youth available to the construction industry, and youth who are disinterested in construction-related occupations (Carr, 2005; Gibbs, 2005; "Unprecedented growth," 2004).

In a 2004 construction data report, Simonson (2005) indicated that the rapidly growing residential market was predicted to slow down as the private and public nonresidential construction would accelerate. In all, the construction industry employed an average of 7.0 million workers in 2004 (Simonson, 2005).

In 1982 The Business Roundtable conducted a study, titled Construction Training Through Vocational Education, to determine if the resources of the U.S. vocational education system could fulfill the unmet training needs of the construction industry. The study was conducted because there was a lack of educational training providing requisite skills, coupled with a low amount of prospective workers entering the construction industry workforce. Data for this study was derived from construction company owners, construction trade associations, and state vocational education systems. The method of data collection was not revealed within the study results.

In regards to the data collected from all parties involved in the study, The Business Roundtable study team generated the following summary of their findings: 1) The U.S. vocational education system is underutilized for training craftsmen for the construction industry; 2) Organizations associated with state vocation education systems could contribute a greater amount to construction training than they have in the past; 3) National education associations can assist coordination between the construction industry and education; 4) Other industries are being supplied with a greater amount of trained personnel as compared to the construction industry; 5) High school students being trained for construction are almost exclusively oriented toward residential or small commercial construction; 6) Some government and industry groups which have influenced construction training policies and methods in the past are becoming more receptive of letting other educational entities serve in training capacities; 7) The construction

industry is unable to accurately project its workforce demands on a long-term basis for specific localities; 8) There is a lack of communication between the construction industry and educators; 9) Construction trade unions and some large associations prefer traditional apprenticeship programs, rather than accepting credit-for-training obtained from other sources or competency-based training. Furthermore, the construction industry does not view public vocational education as a viable method of meeting workforce shortages; 10) Our society perceives vocational training as an undesirable alternative to professional or technical training. The public education system is geared heavily upon preparing students for four-year colleges, therefore emphasizing preparation for college at the expense of preparation for employment; and 11) There is a reluctance to use state funds to finance vocational training for students who may leave that state to work elsewhere (The Business Roundtable, 1992).

The Construction Training Through Vocational Education study also included the viewpoints from industry members and vocational educators regarding why vocational education systems are not producing an adequate amount of craft workers to meet industry demands. Contractors within the construction industry cited four deficiencies schools have displayed: 1) Courses of study were not available for specific trades or were oriented toward another segment of the industry. In addition, where requisite curriculum did exist, the proper facilities were not available; 2) Qualified instructors were not available; 3) Several education administrators were unwilling to cooperate with employers in regards to curriculum planning, facility utilization, time requirements, and other essential items; and 4) Construction vocational education training is oriented almost exclusively to home building and small commercial construction (The Business Roundtable, 1992).

Vocational educators cited five deficiencies construction industry members have displayed. Contractors have not assumed their proper role in development of training programs. Employment fluctuations and mobility requirements for construction employees have not been given adequate consideration when dealing with training needs. The construction industry has not provided occupational analysis for a significant number of crafts, thus complicating curriculum development. Contractors' support of locally negotiated training funds has encouraged the establishment of training centers that compete with vocational education systems. The construction industry lacks the ability to accurately forecast future work-force needs (The Business Roundtable, 1992).

There is a glaring figure detailed within the Construction Training Through Vocational Education study that appears to mirror current statistics. The similarity pertains to the projected amount of craft workers needed to supplement construction industry demands. In April 1980, the Department of Labor's annual construction industry report projected that there would be 900,000 new jobs and 1.5 million job vacancies by 1990. According to these numbers, the construction industry would require 2.4 million craft workers by 1990 to supplement the workforce demand brought on by new positions, retirements, and for those who shift into different careers (cited in The Business Roundtable, 1992). Current statistics, provided by the Bureau of Labor, project that the construction industry will add nearly one million new workers by the year 2012 (cited in Carr, 2005; Heffner, 2005; Reese, 2005; "Unprecedented growth," 2004). When considering that the construction industry and vocational education systems recognized the high demand for construction workers back in 1982, why does this problem still exist?

Increasing student awareness of the construction industry

It was indicated within chapter one of this study that high school students are disinterested in construction industry careers because they view them as menial, low paying jobs that are below their standards (Gibbs, 2005). Another cause of high school students' disinterest in the construction industry can be attributed to the perceptions held by parents that vocational education is for someone else's child, because their child is going to college (Banks & Norris-Huss, 2001; Daggett, 2003; Kerka, 2000). A study, titled Major Needs of Career and Technical Education in the Year 2000, conducted by the National Dissemination for CTE indicated that this perception is also prevalent among teachers, counselors, and administrators (Banks & Norris-Huss, 2001).

A method to reverse this perception is to increase enrollment in construction-related CTE courses at the high school level. In doing so, this may help expose students to the benefits the construction industry has to offer through multiple arenas of training or education. One approach to increase student enrollment in construction-related CTE courses is to incorporate core academics. Through infusing core academic subjects into CTE curriculum, it is anticipated that high school graduates will have attractive options available in multiple arenas: in two- or four-year colleges, within the paid labor force, or in pursuing post-secondary education and paid employment simultaneously (Plank, 2002). Other options to assist students in viewing construction occupations as viable careers include developing tech-prep programs and career academies. Tech-prep programs and career academies have helped to define pathways, while also assisting to raise the academic achievement of CTE students (Lewis, 2005; Reese, 2003). Associated General Contractors (AGC) CEO Stephen E. Sandherr stated that, "Career academies have proven that they prepare students for the workforce by integrating career and academic

skills into the education process" (cited in Heffner, 2005, p. 34). Subsequent to providing students with prerequisite knowledge, CTE programs must ensure that every student is informed about which local community-technical college or apprenticeship program offers opportunities for continued professional development beyond high school (Stone, 2003).

Construction in Wisconsin's Fox Valley Region

The increase in construction was also noticeable in Wisconsin's Fox Valley Region. In 2004, the city of Neenah alone recorded $96.4 million in building activity. This total was Neenah's highest amount of construction activity, beating the previous record of $62 million, set in 1999, by $34.4 million. However, in 2005 Neenah recorded a slightly lesser amount of $64 million in construction activity. In comparison to the 2004 figures, the lesser amount of construction activity in 2005 could give the impression that the construction market in Neenah is on a downward trend. Nevertheless, the $64 million recorded in 2005 is the city's second highest amount of construction dollars. In addition, Neenah's Director of Community Development, Bob Buckingham, stated that "the community can expect continued benefits from construction growth in the years ahead" (Behnke, 2006). The Fox Valley Region consists of sixteen communities, so one can anticipate that if the city of Neenah itself has a great amount of construction activity, the rest of the Fox Valley cities will follow suit.

Understanding the demand for skilled construction workers in the Fox Valley Region, Boldt Construction Company, located in Appleton, developed the Explorers program that gives high school students a hands-on look at the construction industry. Participants in the Explorers program are provided the opportunity to evaluate the various components of an apprenticeship program, which include resume writing, tools of the trades, and job duties. The construction trades apprenticeships that are highlighted by the Explorers program include: structural steel and

welding, carpentry-specialty contracting, electrical, plumbing and pipe fitting, concrete and masonry, and mechanical and heavy equipment (Exploring the future, 2003).

The Explorers program affords high school students the opportunity to experience different construction trades prior to graduation, so they can make an informed decision as to which career they would like to seek after high school. Bob Heimann, Boldt's vice president of information services and a parent of two Explorers program participants, stated that "My boys weren't getting the same kind of exposure to the world of work as part of their high school curriculum as that afforded by Explorers" (Exploring the future, 2003, ¶17). After completing seven out the ten sessions offered, students are presented with a career-exploring diploma from Boldt Construction Company. To date, Boldt has served approximately 700 youth (Exploring the future, 2003).

Post graduation occupation selection by Appleton East High School students

To determine what occupations recent graduates have chosen, all three high schools within the Appleton Area School District conduct follow up surveys of each graduating class. This survey is sent out to each graduate one year after graduation. The survey asks the graduate to indicate their current occupation by writing it in, rather than choosing from a list of occupations. The survey itself was not available, therefore, raw data was the only information available for review. The following data was obtained from Appleton East High School follow-up surveys.

Survey results from the 347 graduates of the class of 2001 (Appleton East High School Guidance Department, 2001) revealed that eight graduates had identified their occupation as construction related. Of these eight, there were two working general construction, two electrician helpers, two in home improvement, one laborer, and one plumber's helper. Survey results from

the 337 graduates of the class of 2002 (Appleton East High School Guidance Department, 2002) revealed that six graduates had identified their occupation as construction related. Of these six, there were four laborers and two working general construction. Survey results from the 358 graduates of the class of 2003 (Appleton East High School Guidance Department, 2003) revealed that four graduates identified their occupation as construction related. Of these four, there were two laborers and two working general construction. Survey results from the 350 graduates of the class of 2004 (Appleton East High School Guidance Department, 2004) revealed that five graduates identified their occupation as construction related. The specific construction occupation for these five respondents was not indicated. Survey results from the 355 graduates of the class of 2005 (Appleton East High School Guidance Department, 2005) revealed that one graduate identified his/her occupation as construction related. The specific construction occupation for this respondent was not indicated.

The data from these five follow-up surveys indicate that a small percentage of students from Appleton East High School chose to work in the construction industry after graduation. The reasons for the graduates' career choices were not stated in the survey results. Thus, the data from the follow-up surveys does not give a clear indication as to what factors influenced each student's career choice. Therefore, a study of students enrolled in Career and Technical Education classes was needed to determine why there is such a small amount of students entering the construction industry after high school.

Summary

The literature provides evidence that there is a great demand for workers in the construction industry, but the number of qualified high school students who enter into the construction industry workforce is not supplementing this demand. In addition, a communication

problem continues to exist between the construction industry and vocational education systems. After reviewing the small amount of Appleton East High School graduates who chose a career in construction, it is evident that a problem exists and a study must be performed. Chapter three will discuss the methodology which was used to gather data for this study.

Chapter III

Methodology

Introduction

The purpose of this study is to determine what factors are influencing Appleton East High School Technology Education students' perception of construction-related occupations. Data was collected from Appleton East High School Technology Education students through the utilization of a voluntary survey during the spring semester of 2006.

Chapter two of this study, Review of Literature, revealed that there is little current research available pertaining to the declining number of high school students entering the construction industry after graduation. Therefore, current relevant data needed to be obtained to complete the research portion of this study. This chapter discusses subject selection and description, instrumentation, data collection, data analysis, and methodological limitations.

Subject Selection and Description

The subjects chosen for this study were Appleton East High School students enrolled in Technology Education classes. The Technology Education classes of which the students were enrolled in included: Carpentry and Wiring, Construction Techniques, Cabinet and Furniture Fabrication, Architectural Design, Engineering II, Manufacturing Enterprise, and Basic Photography. Student grade level ranged from grades nine through twelve. The subjects were chosen from these classes because this method of selection encompassed all ranges of career interests, thus measuring various perceptions that provided relevant information as how to effectively market construction-related careers.

Instrumentation

An anonymous survey (See appendix A) was used to gather the data for the research portion of this study. The questions within the instrument were used to establish gender, grade level, method of course selection, and personal perceptions towards construction classes and construction-related occupations. The instrument contained two subject profile questions, nine yes or no based questions, and twelve Likert scale responses. All of the questions were formatted so the participating students simply had to circle their responses. This was done to make the survey less difficult to understand and complete, as well to increase the efficiency of tabulating the subjects' responses. The researcher established and developed the survey questions off of pertinent literature, content knowledge, and verbal communication with local construction companies and trade associations.

Data Collection

Permission was obtained from Appleton East High School principal, Mr. Ben Vogel, to collect data from students through the use of a survey. Parental permission was also obtained, in the form of a signed consent form (See appendix B), from each of the participants prior to the dissemination of the survey. The survey was administered to the subjects by their Technology Education instructor on a regular scheduled day during their Technology Education class. Each class period was 55 minutes in length and the students had the option of using the entire class hour to complete the survey. The instructor read aloud the directions detailed on the survey before the survey was handed out in an effort to keep the students' attention focused on the directions. They were then given the survey to be completed individually. After completion, each student was directed to return the survey to the instructor and were then allowed to work on

course work for the remainder of the class period. All completed surveys were collected by the instructor.

Data Analysis

All appropriate descriptive statistics were conducted on the data. Nominal and ordinal scales of measurement were collected and mode in addition to mean measures of central tendency were utilized to analyze research questions one through seven outlined in chapter one of this study.

Methodological Limitations

Data collected was derived from a suburban school district and may not be relevant towards rural and or urban school districts. In addition, the subjects were also limited to those students who were enrolled in a Technology Education class at Appleton East High School, therefore, the data only represented a small portion of the total school population.

The date at which the research data was collected was a limitation to the validity of this study. Due to the time frame of which the researcher had to schedule to complete this study, the survey was administered towards the end of the academic school year. This caused a decrease in the number of students who chose to participate, due to lack of motivation. In addition, the students completing the survey may have had a different attitude towards the survey questions as compared to administering the survey at the beginning of the academic school year.

Summary

The introduction and review of literature has revealed that there is a considerable shortage of skilled workers entering the construction industry. This was reinforced by the pertinent statistics and relevant studies conducted, which highlight the details of this problem. The analysis of the study's survey results, detailed in chapter four, will hopefully provide

answers as to what perceptions Appleton East High School students hold about construction-related careers.

Chapter IV

Results

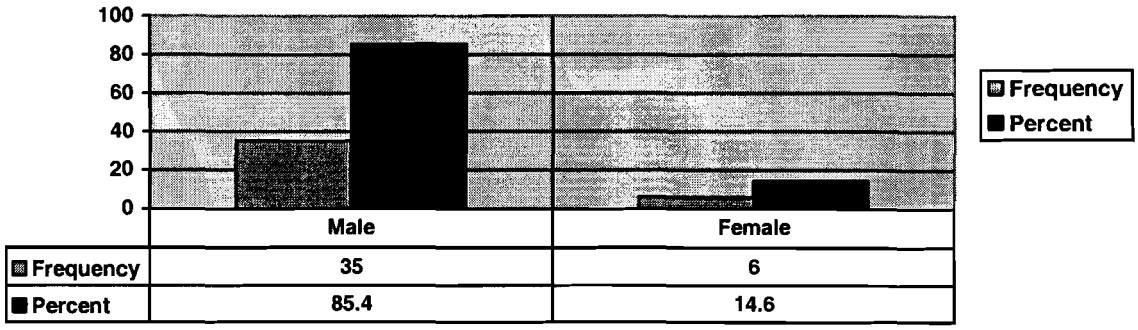
Introduction

This chapter discusses the data collected from the Analysis of the Influences on Appleton East High School Technology Education Students' Perception of the Construction Industry survey (See appendix A). The purpose of this study is to determine what factors are influencing Appleton East High School Technology Education students' perception of construction-related occupations. The first section of this chapter will detail the demographics of the participating students. The second section deals with item analysis and will reveal the respondents' responses to each survey item. This section will list each research question from chapter one of this study and identify the survey items that were intended to answer those questions.

Demographic Information

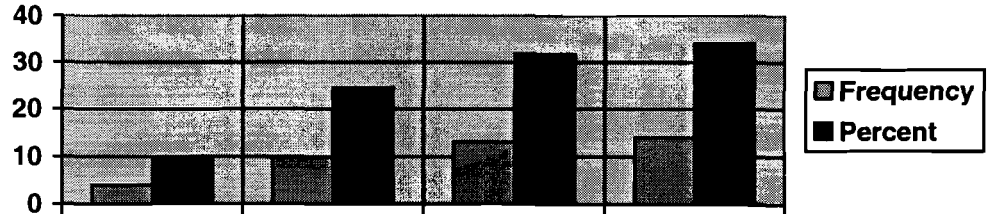
There was a total of 110 parental Consent to Participate forms (See appendix B) given to Technology Education students at Appleton East High School during May of 2006. The classes of which these students were enrolled in included: Carpentry and Wiring, Construction Techniques, Cabinet and Furniture Fabrication, Architectural Design, Engineering II, Manufacturing Enterprise, and Basic Photography. Of those 110 consent forms, 41 were returned. Every student, of the 41 students who returned the completed consent form, completed the survey. This resulted in a 37.3% return rate. Demographic item number one was used to identify the gender of the respondents. Of the 41 participates, 35 were male and 6 were female (See figure 1). Demographic item number two was used to identify the grade level of the respondents. The grade levels of the survey respondents ranged from grades 9 through 12. There were 4 freshmen, 10 sophomores, 13 juniors, and 14 seniors (See figure 2).

Figure 1: Gender



	Male	Female
Frequency	35	6
Percent	85.4	14.6

Figure 2: Respondent Grade Levels



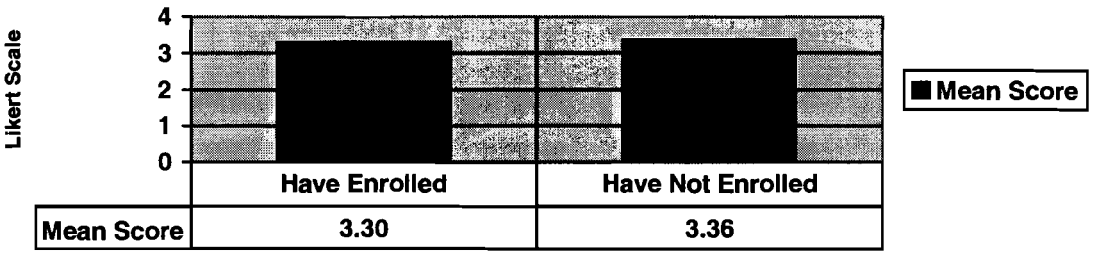
	Freshmen	Sophomore	Junior	Senior
Frequency	4	10	13	14
Percent	9.8	24.4	31.7	34.1

Research Question Number One

Is enrollment in construction-related courses a factor that influences student perceptions of construction occupations? Survey item number four was used to determine if the respondent had taken a construction-related course. The most frequent response was yes with 30, while 11 responded no. This data was then used to isolate the responses to survey items 14-22, which were designed to measure perceptions, to analyze if the students' perceptions of construction occupations were influenced by enrollment. Items 14-22 used a Likert scale of measurement with the following values: 1 represents strongly disagree; 2 represents mildly disagree; 3 represents agree mildly; and 4 represents strongly agree.

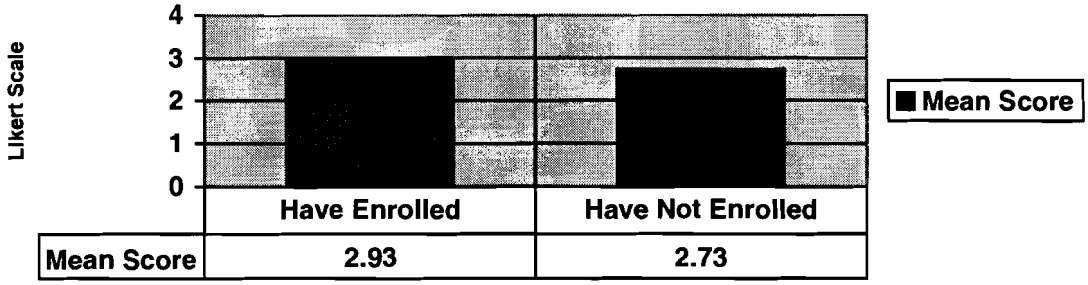
Item number 14 states, "The construction industry has careers that pay good wages/money." Of the 30 respondents who have taken a construction-related course, 11 strongly agreed, 17 agreed mildly, 2 disagreed mildly, and 0 strongly disagreed. This data results in a mean score of 3.30. Of the 11 respondents who have not taken a construction-related course, 5 strongly agreed, 5 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data results in a mean score of 3.36 (See figure 3).

Figure 3: Enrollment Based Perceptions - Construction Industry Pays Good Wages/Money



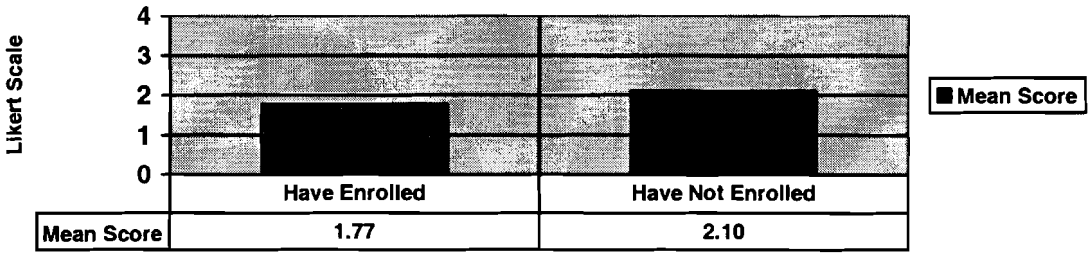
Item number 15 states, "construction-related careers offer safe working environments." Of the 30 respondents who have taken a construction-related course, 6 strongly agreed, 16 agreed mildly, 8 disagreed mildly, and 0 strongly disagreed. This data results in a mean score of 2.93. Of the 11 respondents who have not taken a construction-related course, 1 strongly agreed, 6 agreed mildly, 4 disagreed mildly, and 0 strongly disagreed. This data results in a mean score of 2.73 (See figure 4).

Figure 4: Enrollment Based Perceptions - Safety of Construction Occupations



Item number 16 states, "I do not need any additional training after high school to work in the construction industry." Of the 30 respondents who have taken a construction-related course, 0 strongly disagreed, 2 agreed mildly, 19 disagreed mildly, and 9 strongly disagreed. This data results in a mean score of 1.77. Of the 11 respondents who have not taken a construction-related course, 0 strongly agreed, 3 agreed mildly, 5 disagreed mildly, 2 strongly disagreed, and one did not respond. This data results in a mean score of 2.10 (See figure 5).

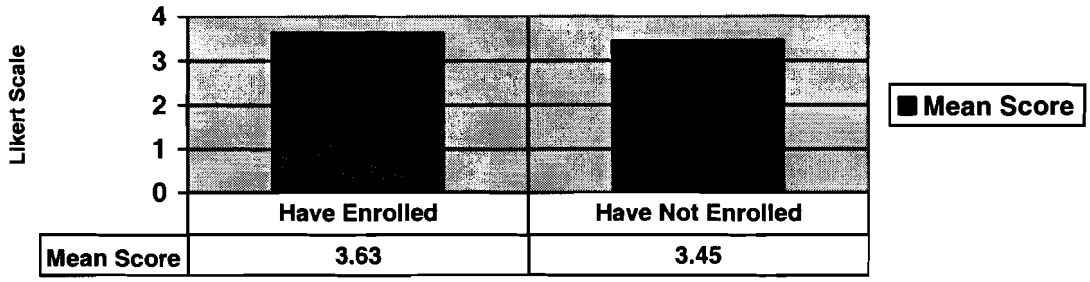
Figure 5: Enrollment Based Perceptions - Additional Training



Item number 17 states, "The construction industry is an important part of the United States economy." Of the 30 respondents who have taken a construction-related course, 19 strongly agreed, 11 agreed mildly, 0 disagreed mildly, and 0 strongly disagreed. This data results in a mean score of 3.63. Of the 11 respondents who have not taken a construction-related course,

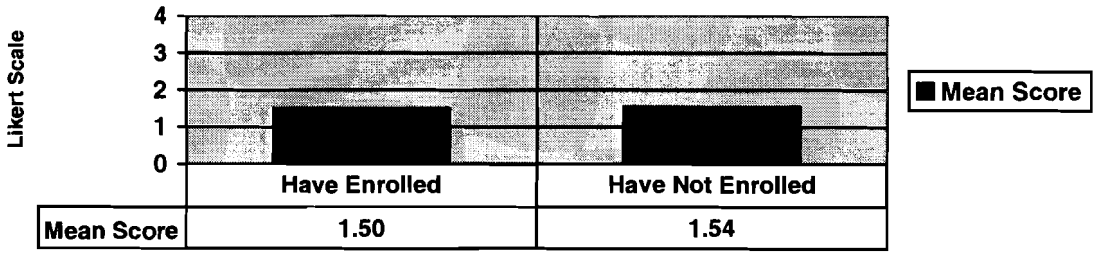
6 strongly agreed, 4 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data results in a mean score of 3.45 (See figure 6).

Figure 6: Enrollment Based Perceptions - Construction Industry Importance to the US Economy



Item number 18 states, "There are very few jobs available in the construction industry." Of the 30 respondents who have taken a construction-related course, 2 strongly agreed, 1 agreed mildly, 7 disagreed mildly, and 20 strongly disagreed. This data results in a mean score of 1.50. Of the 11 respondents who have not taken a construction-related course, 0 strongly agreed, 1 agreed mildly, 4 disagreed mildly, and 6 strongly disagreed. This data results in a mean score of 1.54 (See figure 7).

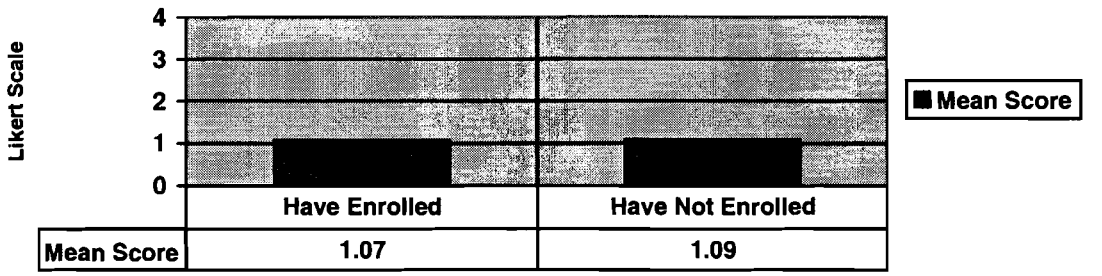
Figure 7: Enrollment Based Perceptions - Few Jobs Available in the Construction Industry



Item number 19 states, "Construction jobs are unimportant." Of the 30 respondents who have taken a construction-related course, 0 strongly agreed, 0 agreed mildly, 2 disagreed mildly,

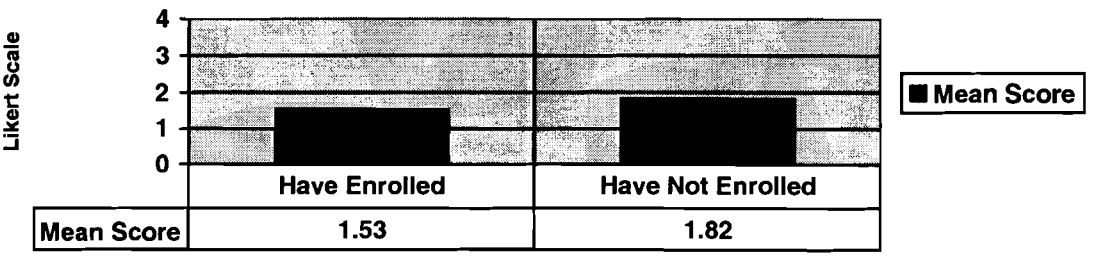
and 28 strongly disagreed. This data results in a mean score of 1.07. Of the 11 respondents who have not taken a construction-related course, 0 strongly agreed, 0 agreed mildly, 1 disagreed mildly and 10 strongly disagreed. This data results in a mean score of 1.09 (See figure 8).

Figure 8: Enrollment Based Perceptions - Construction Jobs are Unimportant



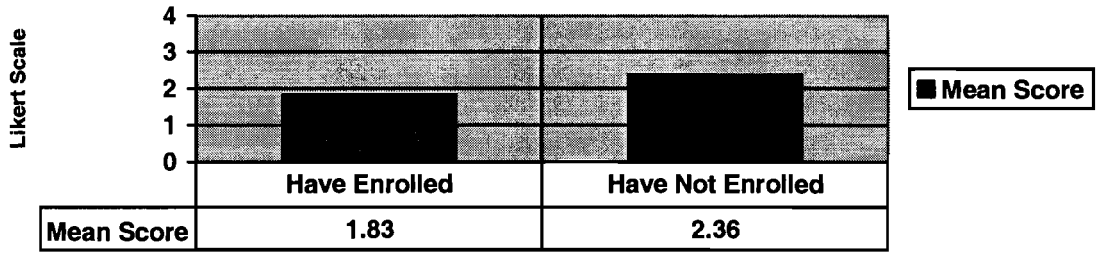
Item number 20 states, "Construction jobs are not good enough for me." Of the 30 respondents who have taken a construction-related course, 1 strongly agreed, 0 agreed mildly, 13 disagreed mildly, and 16 strongly disagreed. This data results in a mean score of 1.53.Of the 11 respondents who have not taken a construction-related course, 0 strongly agreed, 3 agreed mildly, 3 disagreed mildly, and 5 strongly disagreed. This data results in a mean score of 1.82 (See figure 9).

Figure 9: Enrollment Based Perceptions - Construction Jobs are Below Student Standards



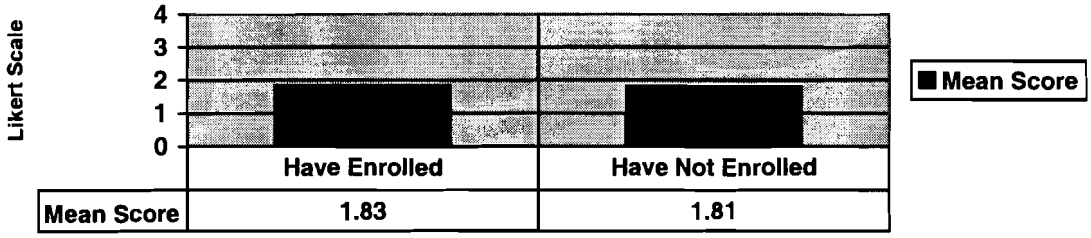
Item number 21 states, "I have never considered working in a construction-related job." Of the 30 respondents who have taken a construction-related course, 3 strongly agreed, 4 agreed mildly, 8 disagreed mildly, and 15 strongly disagreed. This data results in a mean score of 1.83. Of the 11 respondents who have not taken a construction-related course, 2 strongly agreed, 3 agreed mildly, 3 disagreed mildly, and 3 strongly disagreed. This data results in a mean score of 2.36 (See figure 10).

Figure 10: Enrollment Based Perceptions - Never Considered a Career in the Construction Industry



Item number 22 states, "construction jobs are for males only." Of the 30 respondents who have taken a construction-related course, 1 strongly agreed, 6 agreed mildly, 10 disagreed mildly, and 13 strongly disagreed. This data results in a mean score of 1.83.Of the 11 respondents who have not taken a construction-related course, 0 strongly agreed, 3 agreed mildly, 3 disagreed mildly, and 5 strongly disagreed. This data results in a mean score of 1.81 (See figure 11).

Figure 11: Enrollment Based Perceptions - Construction Jobs are for Males Only



Research Question Number Two

Are student perceptions of construction-related courses influenced by the construction teacher? Survey item number eight was used to determine if the construction teacher at Appleton East High School has had an impact on whether on not students choose to enroll in a construction-related class. If the respondent indicated yes the teacher did make an impact, item number eight then measured if the teacher's influence was positive or negative. Of the 41 respondents, 22 students (53.7%) indicated yes, while 19 (46.3%) indicated the construction teacher had no influence on their decision of whether or not to take a construction class. Of the 22 students who indicated yes, 100% stated that the construction teacher had a positive influence on their decision (See figure 12).

Figure 12: Instructors Influence on Enrollment

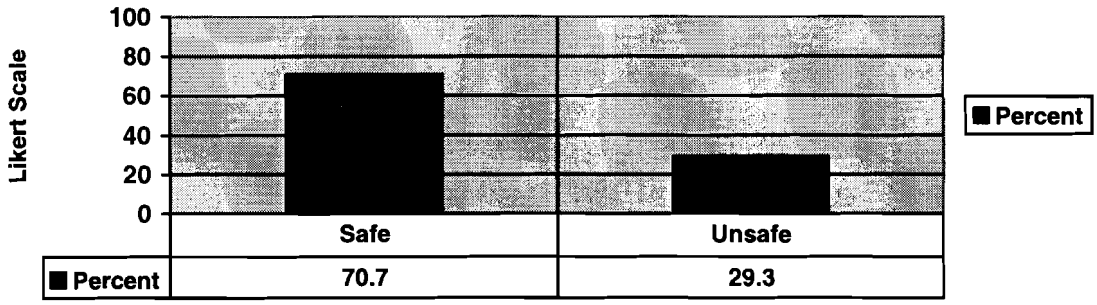
	Yes	No	Postive	Negative
Frequency	22	19	22	0
Percent	53.7	46.3	100.0	0

Research Question Number Three

Does occupational safety influence student perceptions of construction occupations? Items 10 and 15 were used to determine if the respondents felt that construction occupations and construction-related classes offered safe working environments. Item number 10 asked the students if they thought the construction classes at Appleton East High School are dangerous. All 41 respondents indicated no. Due to this 100% response, no data analysis was run for items 14 and 16-22 based off of the responses to item number 10.

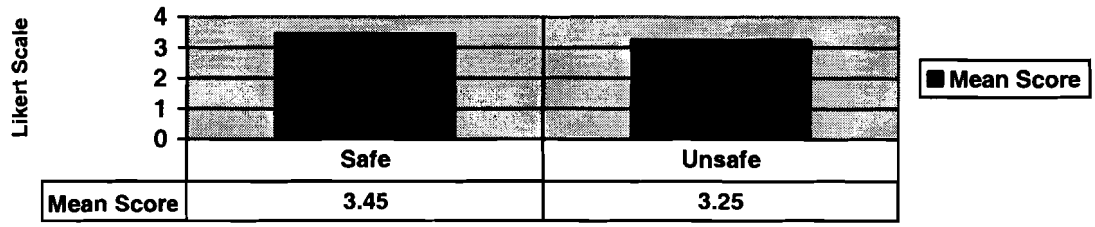
To determine if occupation safety has an influence on student perceptions of construction occupations, the results to item number 15 were used as a replacement to analyze items 14 and 16-22. Item number 15 stated, "construction-related careers offer safe working environments." This item was measured with a Likert scale with the following values: 1 represents strongly disagree; 2 represents mildly disagree; 3 represents agree mildly; and 4 represents strongly agree. Of the 41 respondents, 29 (70.7%) agreed that construction-related careers offer safe work environments, while 12 (29.3%) disagreed.

Figure 13: Construction Occupations are Safe



Item number 14 states, "The construction industry has careers that pay good wages/money." Of the 29 respondents who feel construction is safe, 12 strongly agreed, 15 agreed mildly, 2 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.45. Of the 12 respondents who feel construction is not safe, 4 strongly agreed, 7 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.25 (See figure 14).

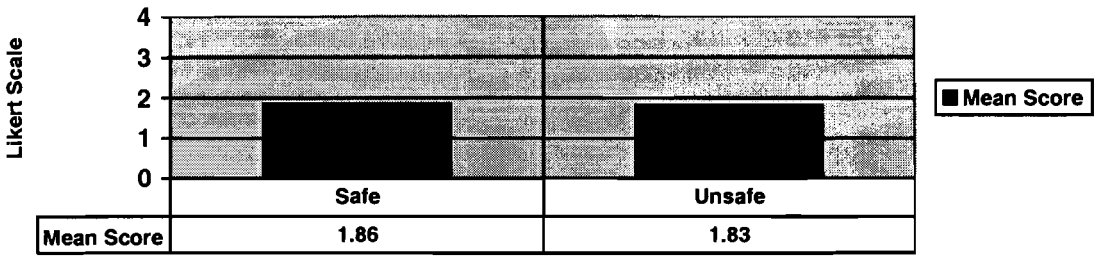
Figure 14: Safety Based Perceptions - Construction Industry Pays Good Wages/Money



Item number 16 states, "I do not need any additional training after high school to work in the construction industry." Of the 29 respondents who feel construction is safe, 0 strongly agreed, 2 agreed mildly, 20 disagreed mildly, 6 strongly disagreed, and 1 did not respond. This data resulted in a mean score of 1.86. Of the 12 respondents who feel construction is not safe, 0

strongly agreed, 3 agreed mildly, 4 disagreed mildly, and 5 strongly disagreed. This data resulted in a mean score of 1.83 (See figure 15).

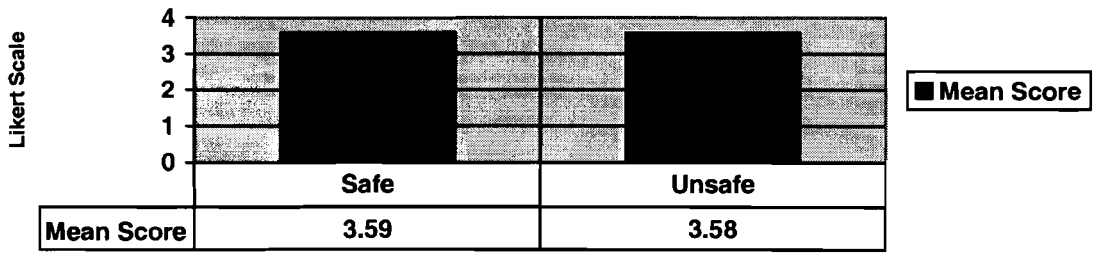
Figure 15: Safety Based Perceptions - Additional Training



Item number 17 states, "The construction industry is an important part of the United States economy." Of the 29 respondents who feel construction is safe, 18 strongly agreed, 10 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.59. Of the 12 respondents who feel construction is not safe, 7 strongly agreed, 5 agreed mildly, 0 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.58 (See figure 16).

Figure 16: Safety Based Perceptions - Construction Industry

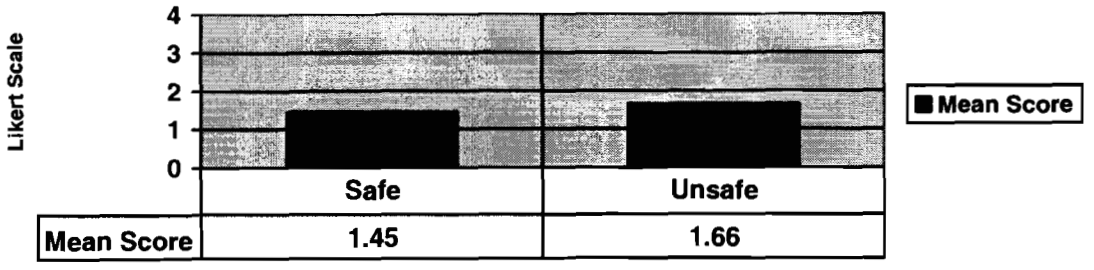
Importance to the US Economy



Item number 18 states, "There are very few jobs available in the construction industry." Of the 29 respondents who feel construction is safe, 1 strongly agreed, 1 agreed mildly, 8 disagreed mildly, and 19 strongly disagreed. This data resulted in a mean score of 1.45. Of the 12

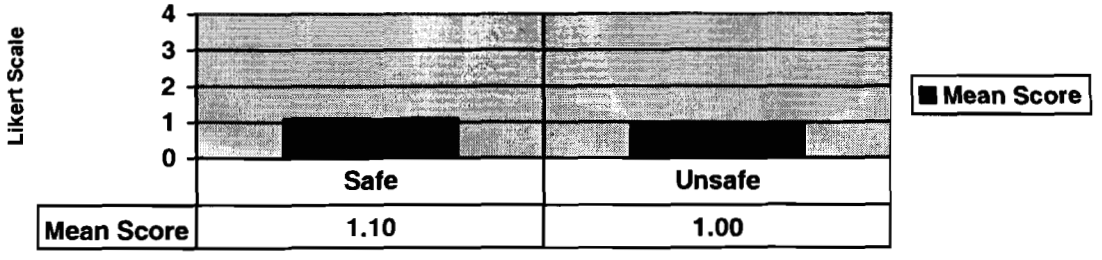
respondents who feel construction is not safe, 1 strongly agreed, 1 agreed mildly, 3 disagreed mildly, and 7 strongly disagreed. This data resulted in a mean score of 1.66 (See figure 17).

Figure 17: Safety Based Perceptions - Few Jobs Available in the Construction Industry



Item number 19 states, "Construction jobs are unimportant." Of the 29 respondents who feel construction is safe, 0 strongly agreed, 0 agreed mildly, 3 disagreed mildly, and 26 strongly disagreed. This data resulted in a mean score of 1.10. Of the 12 respondents who feel construction is not safe, 0 strongly agreed, 0 agreed mildly, 0 disagreed mildly, and 12 strongly disagreed. This data resulted in a mean score of 1.00 (See figure 18).

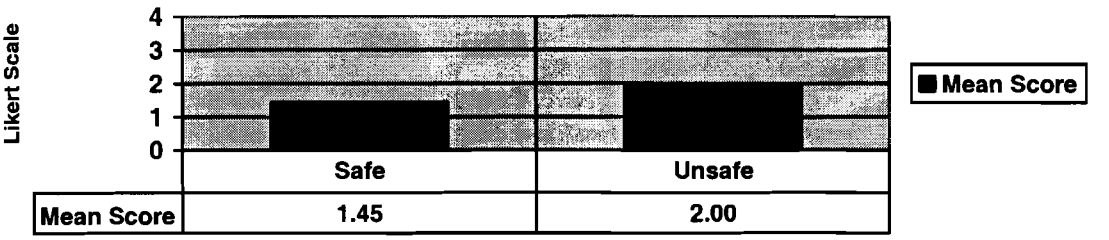
Figure 18: Safety Based Perceptions - Construction Jobs are Unimportant



Item number 20 states, "Construction jobs are not good enough for me." Of the 29 respondents who feel construction is safe, 0 strongly agreed, 1 agreed mildly, 11 disagreed mildly, and 17 strongly disagreed. This data resulted in a mean score of 1.45. Of the 12

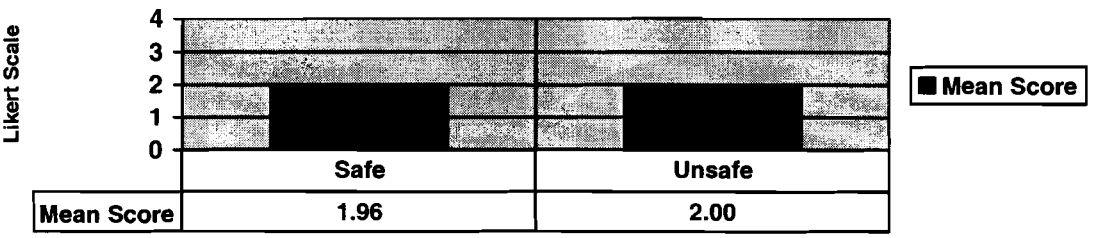
respondents who feel construction is not safe, 1 strongly agreed, 2 agreed mildly, 5 disagreed mildly, and 4 strongly disagreed. This data resulted in a mean score of 2.00 (See figure 19).

Figure 19: Safety Based Perceptions - Construction Jobs are Below Student Standards



Item number 21 states, "I have never considered working in a construction-related job." Of the 29 respondents who feel construction is safe, 4 strongly agreed, 5 agreed mildly, 6 disagreed mildly, and 14 strongly disagreed. This data resulted in a mean score of 1.96. Of the 12 respondents who feel construction is not safe, 1 strongly agreed, 2 agreed mildly, 5 disagreed mildly, and 4 strongly disagreed. This data resulted in a mean score of 2.00 (See figure 20).

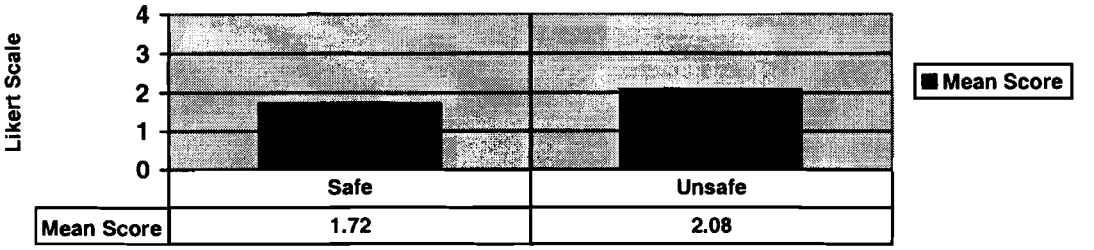
Figure 20: Safety Based Perceptions - Never Considered a Career in the Construction Industry



Item number 22 states, "construction jobs are for males only." Of the 29 respondents who feel construction is safe, 1 strongly agreed, 4 agreed mildly, 10 disagreed mildly, and 14 strongly disagreed. This data resulted in a mean score of 1.72. Of the 12 respondents who feel

construction is not safe, 0 strongly agreed, 5 agreed mildly, 3 disagreed mildly, and 4 strongly disagreed. This data resulted in a mean score of 2.08 (See figure 21).

Figure 21: Safety Based Perceptions - Construction Jobs are for Males

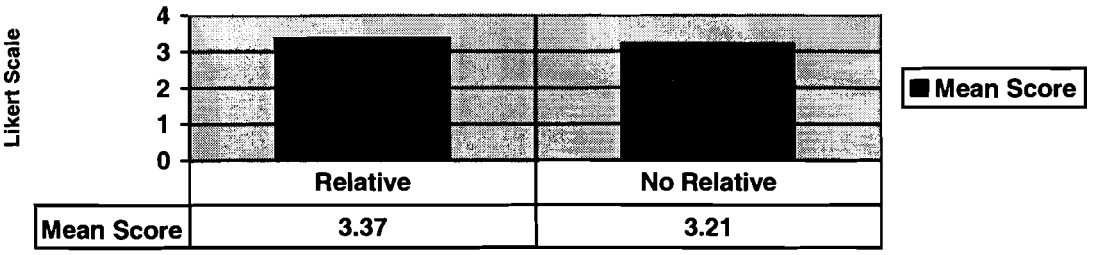


Research Question Number Four

Do family influences affect student perceptions of construction occupations? Item number nine asked the students if they have any relatives that work in the construction industry. Of the 41 respondents, 27 indicated that they have relatives whom work in the construction industry, while 14 replied no. This data was then used to isolate the responses to survey items 14-22, which were designed to measure perceptions, to analyze if the students' perceptions of construction occupations were influenced by family members.

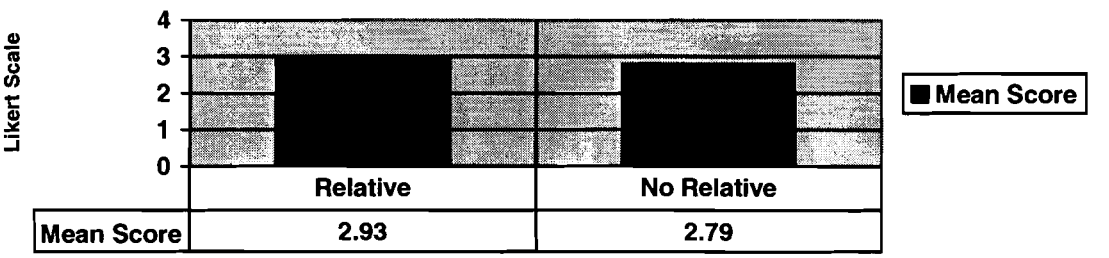
Item number 14 states, "The construction industry has careers that pay good wages/money." Of the 27 respondents that have relatives whom work in the construction industry, 12 strongly agreed, 13 agreed mildly, 2 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.37. Of the 14 respondents who do not have a relative that works in the construction industry, 4 strongly agreed, 9 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.21 (See figure 22).

Figure 22: Family Based Perceptions - Construction Industry Pays Good Wages/Money



Item number 15 states, "construction-related careers offer safe working environments." Of the 27 respondents that have relatives whom work in the construction industry, 5 strongly agreed, 15 agreed mildly, 7 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 2.93. Of the 14 respondents who do not have a relative that works in the construction industry, 2 strongly agreed, 7 agreed mildly, 5 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 2.79 (See figure 23).

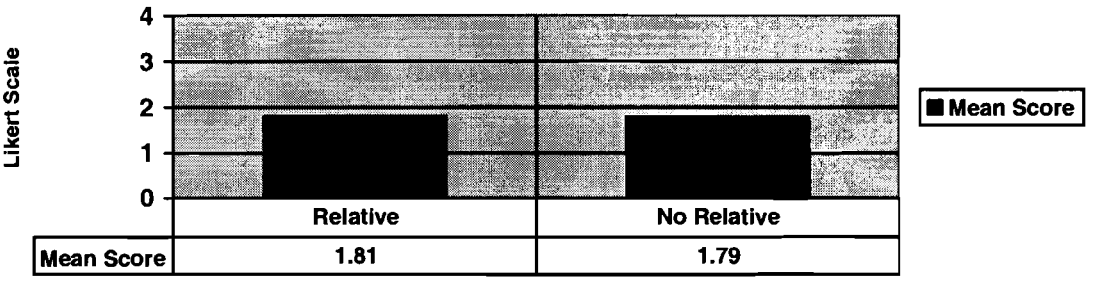
Figure 23: Family Based Perceptions - Safety of Construction Occupations



Item number 16 states, "I do not need any additional training after high school to work in the construction industry." Of the 27 respondents that have relatives whom work in the construction industry, 0 strongly agreed, 3 agreed mildly, 16 disagreed mildly, and 8 strongly disagreed. This data resulted in a mean score of 1.81. Of the 14 respondents who do not have a

relative that works in the construction industry, 0 strongly agreed, 2 agreed mildly, 8 disagreed mildly, 3 strongly disagreed, and 1 did not respond. This data resulted in a mean score of 1.79 (See figure 24).

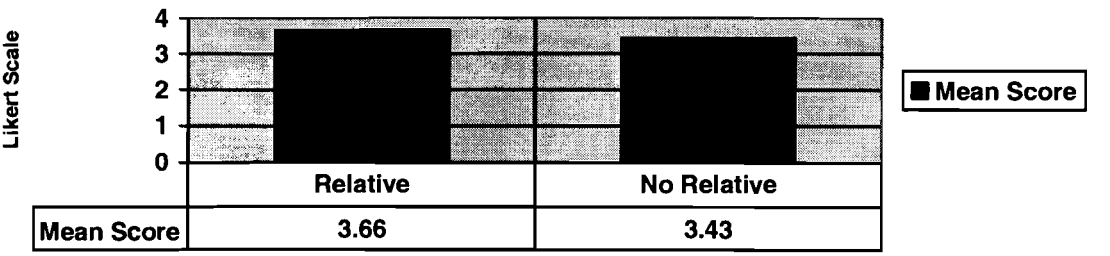
Figure 24: Family Based Perceptions - Additional Training



Item number 17 states, "The construction industry is an important part of the United States economy." Of the 27 respondents that have relatives whom work in the construction industry, 18 strongly agreed, 9 agreed mildly, 0 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.66. Of the 14 respondents who do not have a relative that works in the construction industry, 7 strongly agreed, 6 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.43 (See figure 25).

Figure 25: Family Based Perceptions - Construction Industry

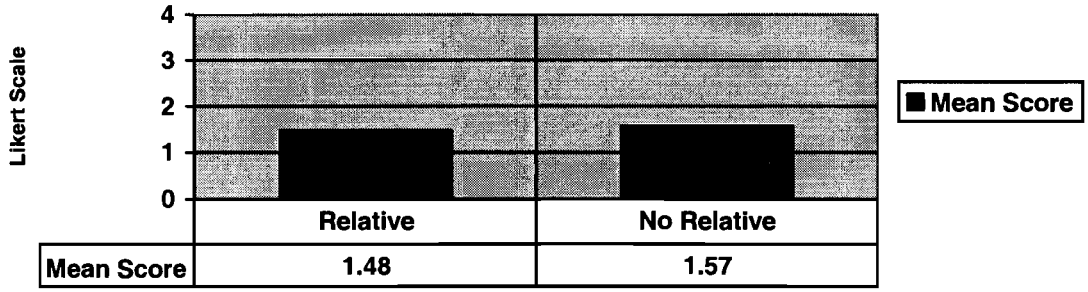
Importance to the US Economy



Item number 18 states, "There are very few jobs available in the construction industry." Of the 27 respondents that have relatives whom work in the construction industry, 1 strongly

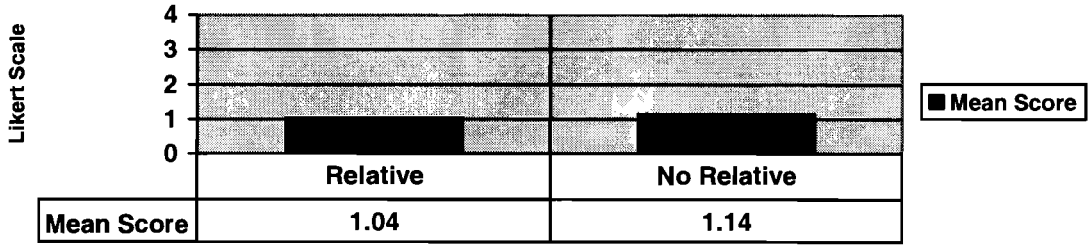
agreed, 2 agreed mildly, 6 disagreed mildly, and 18 strongly disagreed. This data resulted in a mean score of 1.48. Of the 14 respondents who do not have a relative that works in the construction industry, 1 strongly agreed, 0 agreed mildly, 5 disagreed mildly, and 8 strongly disagreed. This data resulted in a mean score of 1.57 (See figure 26).

Figure 26: Family Based Perceptions - Few Jobs Available in the Construction Industry



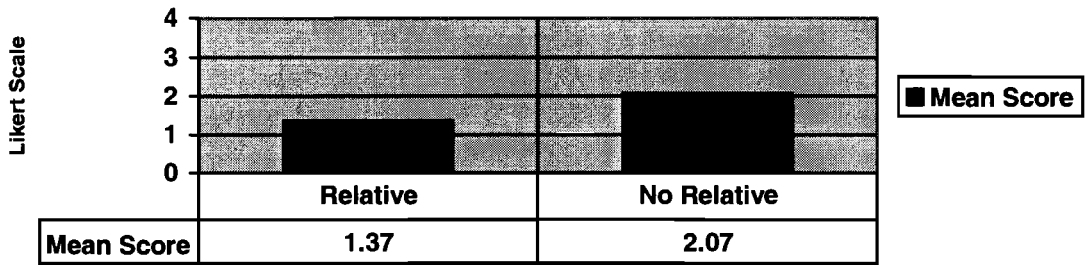
Item number 19 states, "Construction jobs are unimportant." Of the 27 respondents that have relatives whom work in the construction industry, 0 strongly agreed, 0 agreed mildly, 1 disagreed mildly, and 26 strongly disagreed. This data resulted in a mean score of 1.04. Of the 14 respondents who do not have a relative that works in the construction industry, 0 strongly agreed, 0 agreed mildly, 2 disagreed mildly, and 12 strongly disagreed. This data resulted in a mean score of 1.14 (See figure 27).

Figure 27: Family Based Perceptions - Construction Jobs are Unimportant



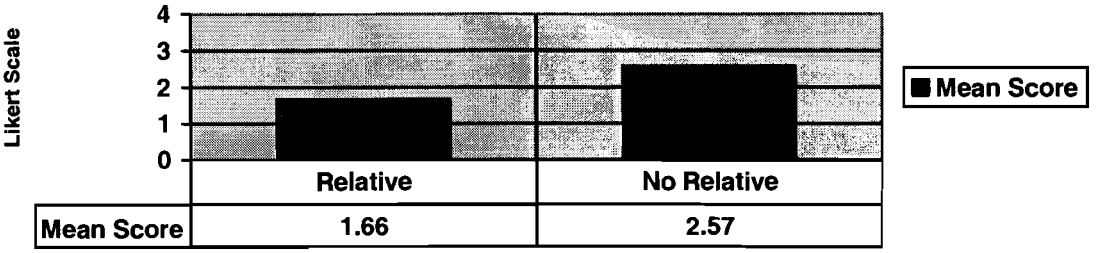
Item number 20 states, "Construction jobs are not good enough for me." Of the 27 respondents that have relatives whom work in the construction industry, 0 strongly agreed, 0 agreed mildly, 10 disagreed mildly, and 17 strongly disagreed. This data resulted in a mean score of 1.37. Of the 14 respondents who do not have a relative that works in the construction industry, 1 strongly agreed, 3 agreed mildly, 6 disagreed mildly, and 4 strongly disagreed. This data resulted in a mean score of 2.07 (See figure 28).

Figure 28: Family Based Perceptions - Construction Jobs are Below Student Standards



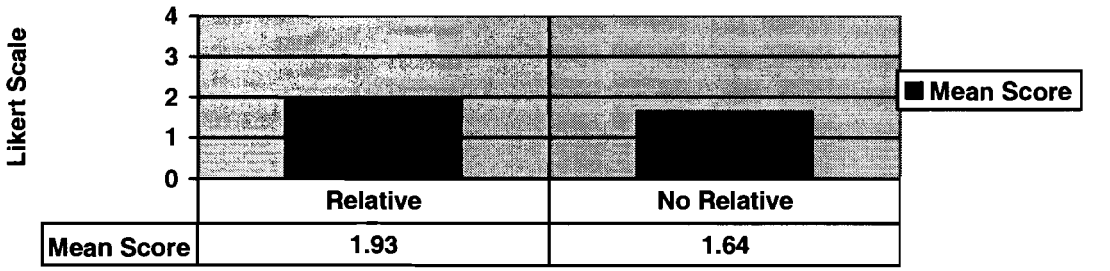
Item number 21 states, "I have never considered working in a construction-related job." Of the 27 respondents that have relatives whom work in the construction industry, 1 strongly agreed, 4 agreed mildly, 7 disagreed mildly, and 15 strongly disagreed. This data resulted in a mean score of 1.66. Of the 14 respondents who do not have a relative that works in the construction industry, 4 strongly agreed, 3 agreed mildly, 4 disagreed mildly, and 3 strongly disagreed. This data resulted in a mean score of 2.57 (See figure 29).

Figure 29: Family Based Perceptions - Never Considered a Career in the Construction Industry



Item number 22 states, "construction jobs are for males only." Of the 27 respondents that have relatives whom work in the construction industry, 1 strongly agreed, 7 agreed mildly, 8 disagreed mildly, and 11 strongly disagreed. This data resulted in a mean score of 1.93. Of the 14 respondents who do not have a relative that works in the construction industry, 0 strongly agreed, 2 agreed mildly, 5 disagreed mildly, and 7 strongly disagreed. This data resulted in a mean score of 1.64 (See figure 30).

Figure 30: Family Based Perceptions - Construction Jobs are for Males



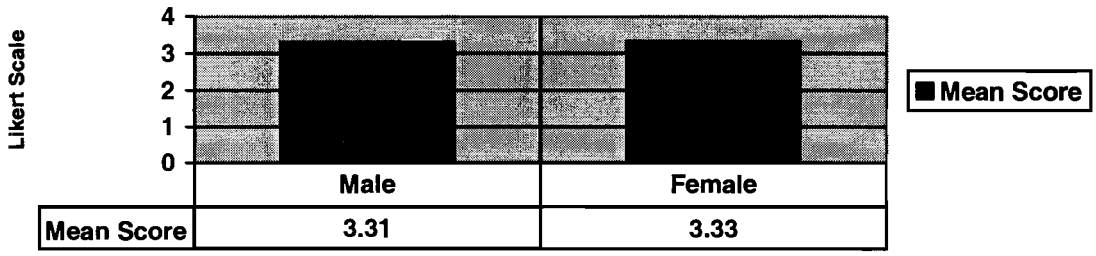
Research Question Number Five

Is gender a factor that affects student perceptions of construction occupations? Item number one on the survey was used to determine gender. Of the 41 respondents, 35 were male and 6 were female. This data was then used to isolate the responses to survey items 14-22, which were designed to measure perceptions, to analyze if the students' perceptions of construction

occupations were affected by gender. Items 14-22 used a Likert scale of measurement with the following values: 1 represents strongly disagree; 2 represents mildly disagree; 3 represents agree mildly; and 4 represents strongly agree.

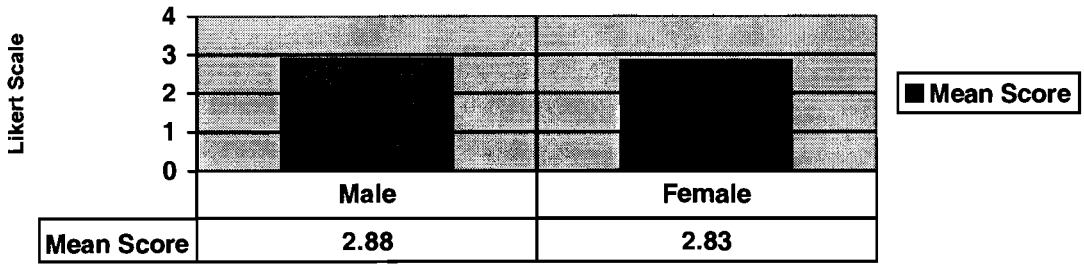
Item number 14 states, "The construction industry has careers that pay good wages/money." Of the 35 male respondents, 13 strongly agreed, 20 agreed mildly, 2 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.31. Of the 6 female respondents, 3 strongly agreed, 2 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.33 (See figure 31).

Figure 31: Gender Based Perceptions - Construction Industry Pays Good Wages/Money



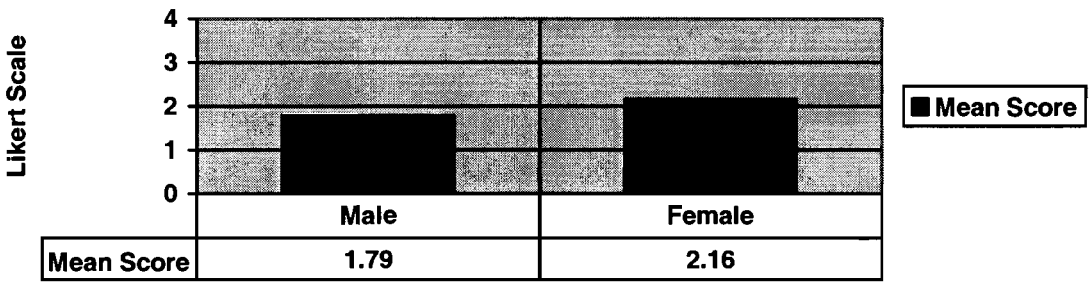
Item number 15 states, "construction-related careers offer safe working environments." Of the 35 male respondents, 7 strongly agreed, 17 agreed mildly, 11 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 2.88. Of the 6 female respondents, 0 strongly agreed, 5 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 2.83 (See figure 32).

Figure 32: Gender Based Perceptions - Safety of Construction Occupations



Item number 16 states, "I do not need any additional training after high school to work in the construction industry." Of the 35 male respondents, 0 strongly agreed, 3 agreed mildly, 21 disagreed mildly, 10 strongly disagreed, and 1 did not respond. This data resulted in a mean score of 1.79. Of the 6 female respondents, 0 strongly agreed, 2 agreed mildly, 3 disagreed mildly, and 1 strongly disagreed. This data resulted in a mean score of 2.16 (See figure 33).

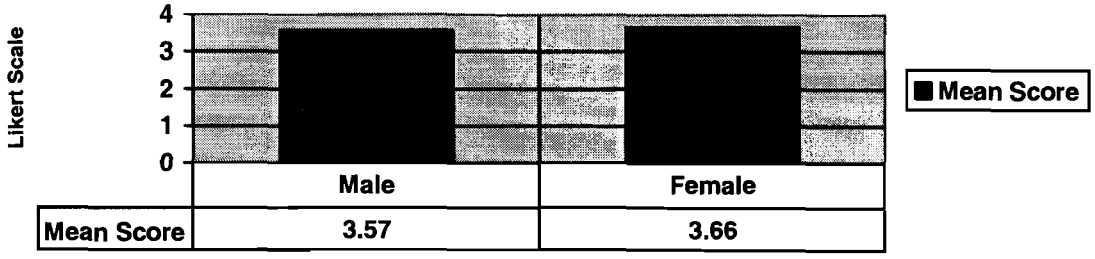
Figure 33: Gender Based Perceptions - Additional Training



Item number 17 states, "The construction industry is an important part of the United States economy." Of the 35 male respondents, 21 strongly agreed, 13 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.57. Of the 6 female respondents, 4 strongly agreed, 2 agreed mildly, 0 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.66 (See figure 34).

Figure 34: Gender Based Perceptions - Construction Industry

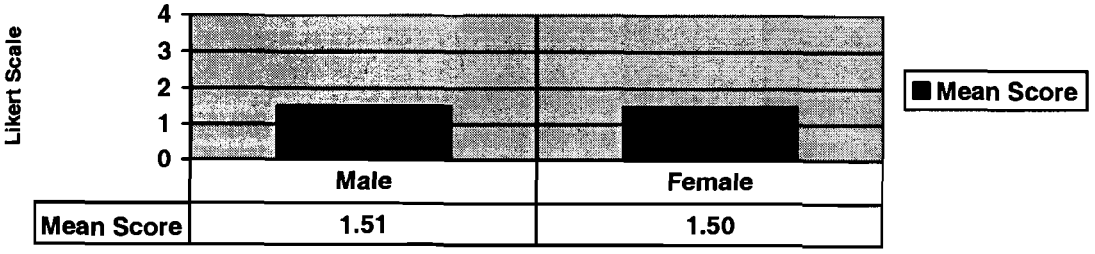
Importance to the US Economy



Item number 18 states, "There are very few jobs available in the construction industry." Of the 35 male respondents, 2 strongly agreed, 2 agreed mildly, 8 disagreed mildly, and 23 strongly disagreed. This data resulted in a mean score of 1.51. Of the 6 female respondents, 0 strongly agreed, 0 agreed mildly, 3 disagreed mildly, and 3 strongly disagreed. This data resulted in a mean score of 1.50 (See figure 35).

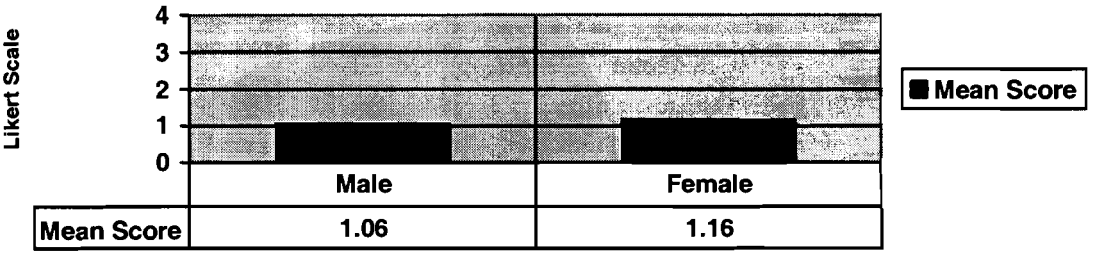
Figure 35: Gender Based Perceptions - Few Jobs Available in the

Construction Industry



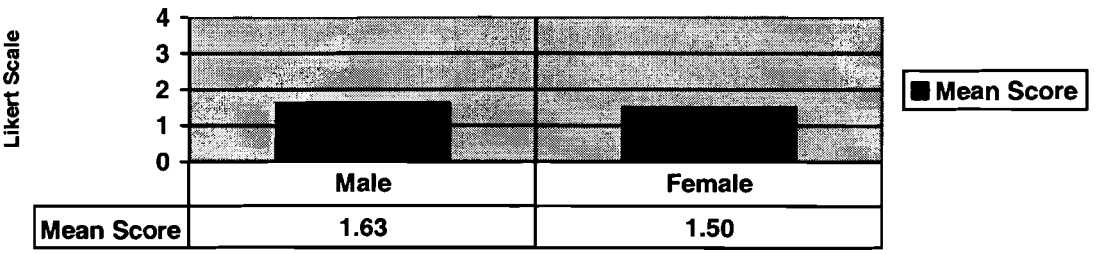
Item number 19 states, "Construction jobs are unimportant." Of the 35 male respondents, 0 strongly agreed, 0 agreed mildly, 2 disagreed mildly, and 33 strongly disagreed. This data resulted in a mean score of 1.06. Of the 6 female respondents, 0 strongly agreed, 0 agreed mildly, 1 disagreed mildly, and 5 strongly disagreed. This data resulted in a mean score of 1.16 (See figure 36).

Figure 36: Gender Based Perceptions - Construction Jobs are Unimportant



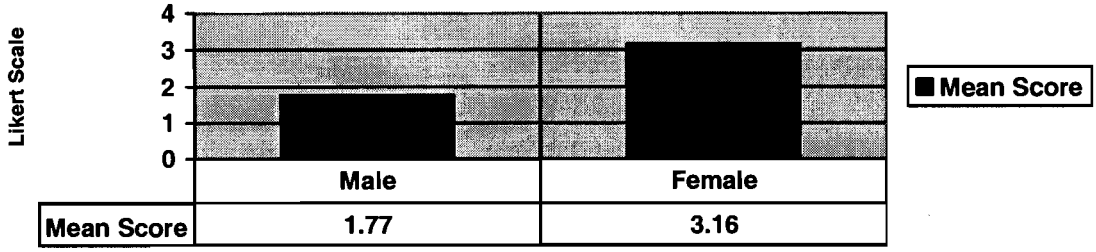
Item number 20 states, "Construction jobs are not good enough for me." Of the 35 male respondents, 1 strongly agreed, 2 agreed mildly, 15 disagreed mildly, and 17 strongly disagreed. This data resulted in a mean score of 1.63. Of the 6 female respondents, 0 strongly agreed, 1 agreed mildly, 1 disagreed mildly, and 4 strongly disagreed. This data resulted in a mean score of 1.50 (See figure 37).

Figure 37: Gender Based Perceptions - Construction Jobs are Below Student Standards



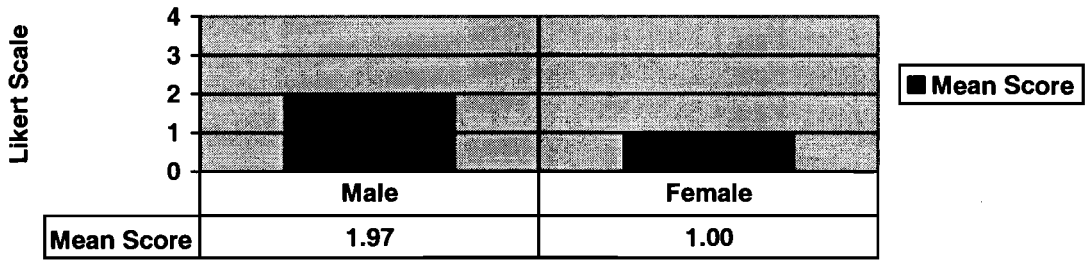
Item number 21 states, "I have never considered working in a construction-related job." Of the 35 male respondents, 3 strongly agreed, 4 agreed mildly, 10 disagreed mildly, and 18 strongly disagreed. This data resulted in a mean score of 1.77. Of the 6 female respondents, 2 strongly agreed, 3 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.16 (See figure 38).

Figure 38: Gender Based Perceptions - Never Considered a Career in the Construction Industry



Item number 22 states, "construction jobs are for males only." Of the 35 male respondents, 1 strongly agreed, 9 agreed mildly, 13 disagreed mildly, and 12 strongly disagreed. This data resulted in a mean score of 1.97. Of the 6 female respondents, 0 strongly agreed, 0 agreed mildly, 0 disagreed mildly, and 6 strongly disagreed. This data resulted in a mean score of 1.00 (See figure 39).

Figure 39: Gender Based Perceptions - Construction Jobs are for Males



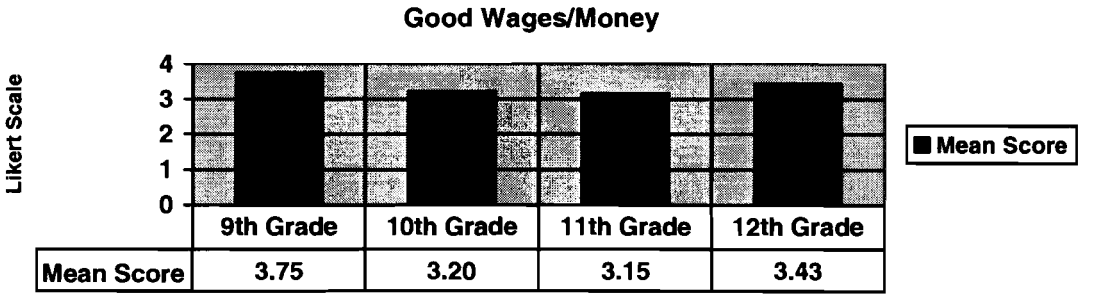
Research Question Number Six

Does grade level influence student perceptions of construction occupations? Item number two on the survey was used to determine the respondent's grade level. Of the 41 respondents, there were 4 freshmen, 10 sophomores, 13 juniors, and 14 seniors (See figure 2). This data was then used to isolate the responses to survey items 14-22, which were designed to measure

perceptions, to analyze if the students' perceptions of construction occupations were influenced by their grade level. Items 14-22 used a Likert scale of measurement with the following values: 1 represents strongly disagree; 2 represents mildly disagree; 3 represents agree mildly; and 4 represents strongly agree.

Item number 14 states, "The construction industry has careers that pay good wages/money." Of the 14 senior respondents, 6 strongly agreed, 8 agreed mildly, 0 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.43. Of the 13 junior respondents, 3 strongly agreed, 9 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.15. Of the 10 sophomore respondents, 4 strongly agreed, 4 agreed mildly, 2 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.20. Of the four freshmen respondents, three strongly agreed, one agreed mildly, zero disagreed mildly, and zero strongly disagreed. This data resulted in a mean score of 3.75 (See figure 40).

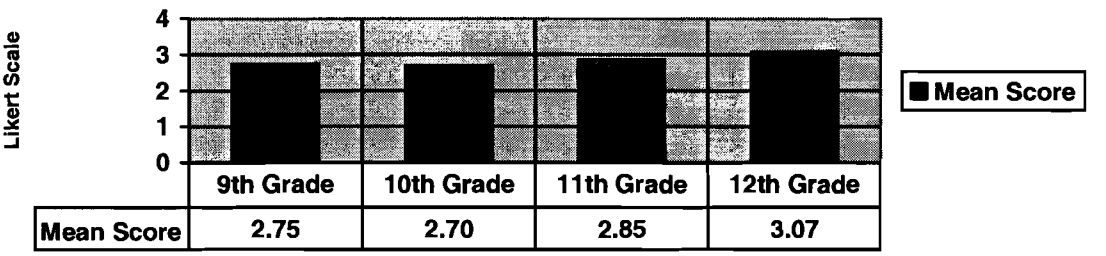
Figure 40: Grade Level Perceptions - Construction Industry Pays



Item number 15 states, "construction-related careers offer safe working environments." Of the 14 senior respondents, 5 strongly agreed, 5 agreed mildly, 4 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.07. Of the 13 junior respondents, 2 strongly agreed, 7 agreed mildly, 4 disagreed mildly, and 0 strongly disagreed. This data resulted

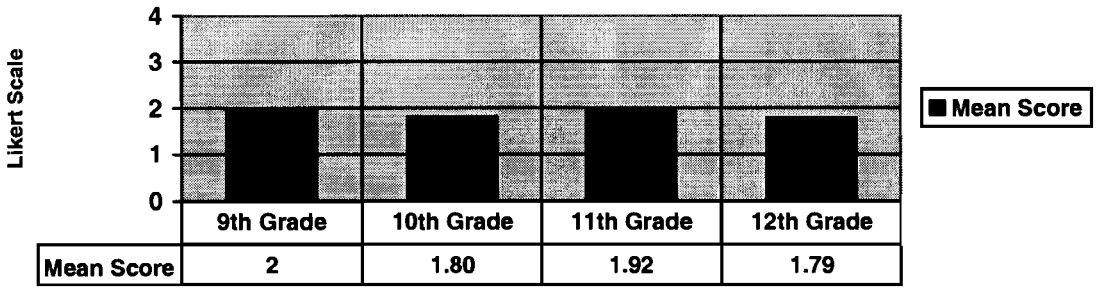
in a mean score of 2.85. Of the 10 sophomore respondents, 0 strongly agreed, 7 agreed mildly, 3 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 2.70. Of the four freshmen respondents, zero strongly agreed, three agreed mildly, one disagreed mildly, and zero strongly disagreed. This data resulted in a mean score of 2.75 (See figure 41).

Figure 41: Grade Level Perceptions - Safety of Construction Occupations



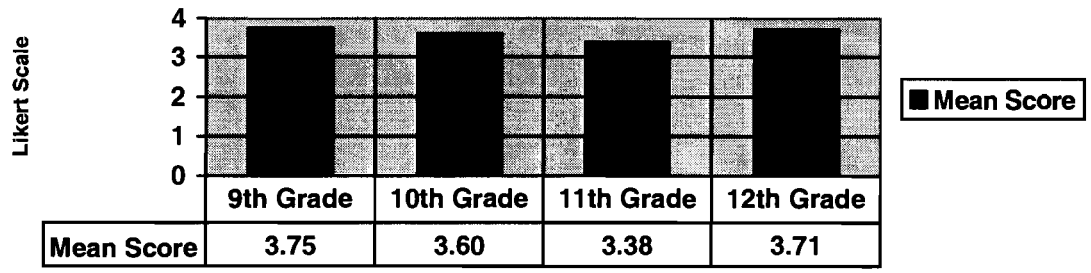
Item number 16 states, "I do not need any additional training after high school to work in the construction industry." Of the 14 senior respondents, 0 strongly agreed, 1 agreed mildly, 9 disagreed mildly, and 4 strongly disagreed. This data resulted in a mean score of 1.79. Of the 13 junior respondents, 0 strongly agreed, 2 agreed mildly, 7 disagreed mildly, 3 strongly disagreed, and one did not reply. This data resulted in a mean score of 1.92. Of the 10 sophomore respondents, 0 strongly agreed, 2 agreed mildly, 4 disagreed mildly, and 4 strongly disagreed. This data resulted in a mean score of 1.80. Of the four freshmen respondents, zero strongly agreed, zero agreed mildly, four disagreed mildly, and zero strongly disagreed. This data resulted in a mean score of 2.00 (See figure 42).

Figure 42: Grade Level Perceptions - Additional Training



Item number 17 states, "The construction industry is an important part of the United States economy." Of the 14 senior respondents, 10 strongly agreed, 4 agreed mildly, 0 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.71. Of the 13 junior respondents, 6 strongly agreed, 6 agreed mildly, 1 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.38. Of the 10 sophomore respondents, 6 strongly agreed, 4 agreed mildly, 0 disagreed mildly, and 0 strongly disagreed. This data resulted in a mean score of 3.60. Of the four freshmen respondents, three strongly agreed, one agreed mildly, zero disagreed mildly, and zero strongly disagreed. This data resulted in a mean score of 3.75 (See figure 43).

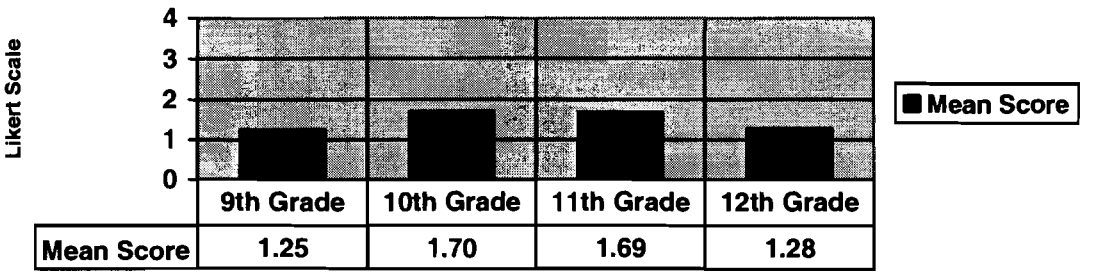
Figure 43: Grade Level Perceptions - Construction Industry Importance to the US Economy



Item number 18 states, "There are very few jobs available in the construction industry." Of the 14 senior respondents, 1 strongly agreed, 0 agreed mildly, 1 disagreed mildly, and 12

strongly disagreed. This data resulted in a mean score of 1.28. Of the 13 junior respondents, 1 strongly agreed, 1 agreed mildly, 4 disagreed mildly, and 7 strongly disagreed. This data resulted in a mean score of 1.69. Of the 10 sophomore respondents, 0 strongly agreed, 1 agreed mildly, 5 disagreed mildly, and 4 strongly disagreed. This data resulted in a mean score of 1.70. Of the four freshmen respondents, zero strongly agreed, zero agreed mildly, one disagreed mildly, and three strongly disagreed. This data resulted in a mean score of 1.25 (See figure 44).

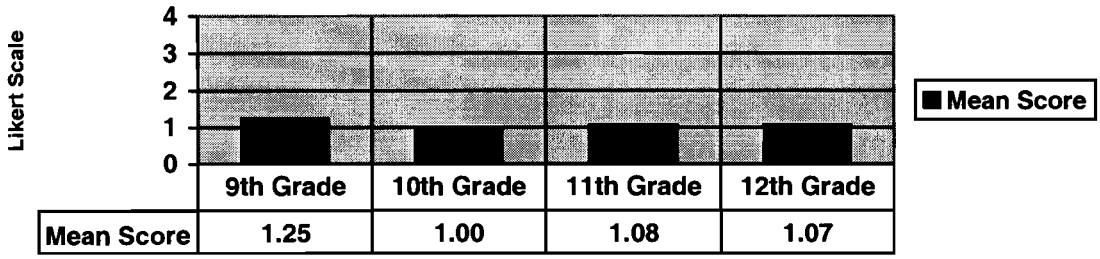
Figure 44: Grade Level Perceptions - Few Jobs Avaialable in the Construction Indsutry



	9th Grade	10th Grade	11th Grade	12th Grade
Mean Score	1.25	1.70	1.69	1.28

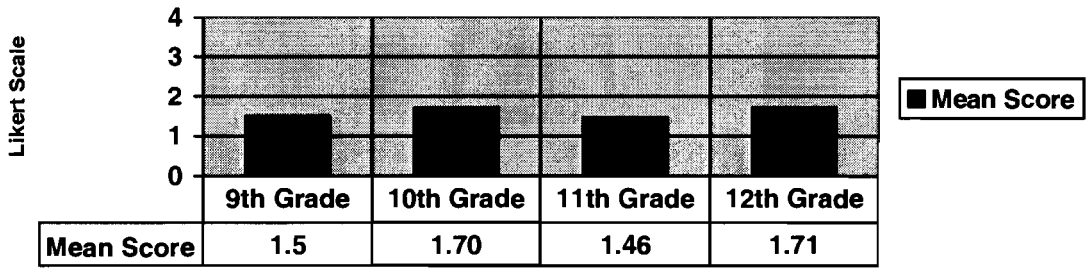
Item number 19 states, "Construction jobs are unimportant." Of the 14 senior respondents, 0 strongly agreed, 0 agreed mildly, 1 disagreed mildly, and 13 strongly disagreed. This data resulted in a mean score of 1.07. Of the 13 junior respondents, 0 strongly agreed, 0 agreed mildly, 1 disagreed mildly, and 12 strongly disagreed. This data resulted in a mean score of 1.08. Of the 10 sophomore respondents, 0 strongly agreed, 0 agreed mildly, 0 disagreed mildly, and 10 strongly disagreed. This data resulted in a mean score of 1.00. Of the four freshmen respondents, zero strongly agreed, zero agreed mildly, one disagreed mildly, and three strongly disagreed. This data resulted in a mean score of 1.25 (See figure 45).

Figure 45: Grade Level Perceptions - Construction Jobs are Unimportant



Item number 20 states, "Construction jobs are not good enough for me." Of the 14 senior respondents, 1 strongly agreed, 1 agreed mildly, 5 disagreed mildly, and 7 strongly disagreed. This data resulted in a mean score of 1.71. Of the 13 junior respondents, 0 strongly agreed, 1 agreed mildly, 4 disagreed mildly, and 8 strongly disagreed. This data resulted in a mean score of 1.46. Of the 10 sophomore respondents, 0 strongly agreed, 1 agreed mildly, 5 disagreed mildly, and 4 strongly disagreed. This data resulted in a mean score of 1.70. Of the four freshmen respondents, zero strongly agreed, zero agreed mildly, two disagreed mildly, and two strongly disagreed. This data resulted in a mean score of 1.5 (See figure 46).

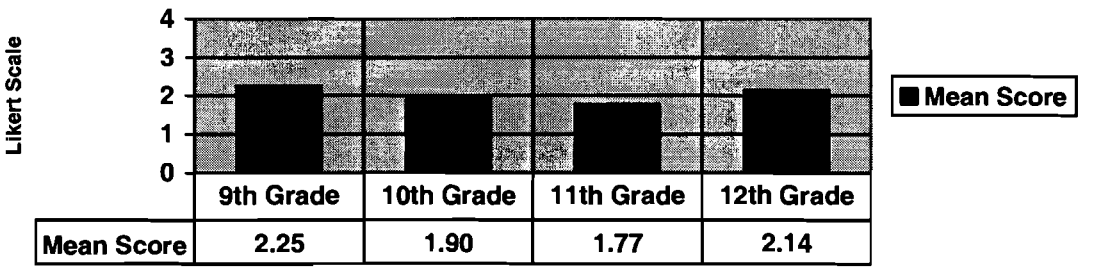
Figure 46: Grade Level Perceptions - Construction Jobs Below Student Standards



Item number 21 states, "I have never considered working in a construction-related job." Of the 14 senior respondents, 1 strongly agreed, 5 agreed mildly, 3 disagreed mildly, and 5

strongly disagreed. This data resulted in a mean score of 2.14. Of the 13 junior respondents, 2 strongly agreed, 0 agreed mildly, 4 disagreed mildly, and 7 strongly disagreed. This data resulted in a mean score of 1.77. Of the 10 sophomore respondents, 1 strongly agreed, 2 agreed mildly, 2 disagreed mildly, and 5 strongly disagreed. This data resulted in a mean score of 1.90. Of the four freshmen respondents, one strongly agreed, zero agreed mildly, two disagreed mildly, and one strongly disagreed. This data resulted in a mean score of 2.25 (See figure 47).

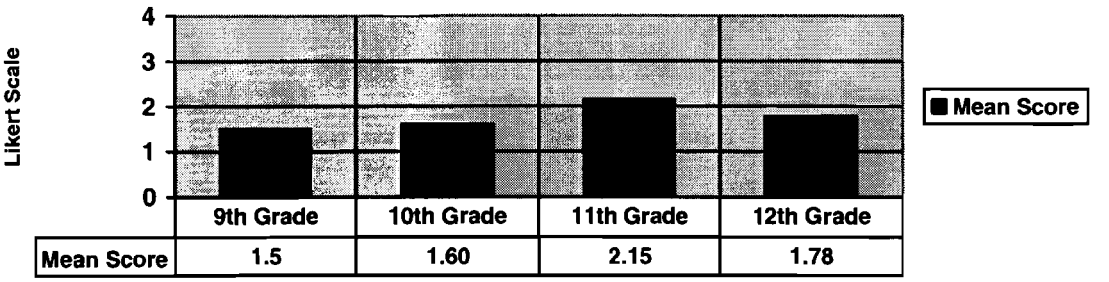
Figure 47: Grade Level Perceptions - Never Considered a Career in the Construction Industry



	9th Grade	10th Grade	11th Grade	12th Grade
Mean Score	2.25	1.90	1.77	2.14

Item number 22 states, "construction jobs are for males only." Of the 14 senior respondents, 0 strongly agreed, 3 agreed mildly, 5 disagreed mildly, and 6 strongly disagreed. This data resulted in a mean score of 1.78. Of the 13 junior respondents, 0 strongly agreed, 5 agreed mildly, 5 disagreed mildly, and 3 strongly disagreed. This data resulted in a mean score of 2.15. Of the 10 sophomore respondents, 1 strongly agreed, 0 agreed mildly, 3 disagreed mildly, and 6 strongly disagreed. This data resulted in a mean score of 1.60. Of the four freshmen respondents, zero strongly agreed, one agreed mildly, zero disagreed mildly, and three strongly disagreed. This data resulted in a mean score of 1.50 (See figure 48).

Figure 48: Grade Level Perceptions - Construction Jobs are for Males

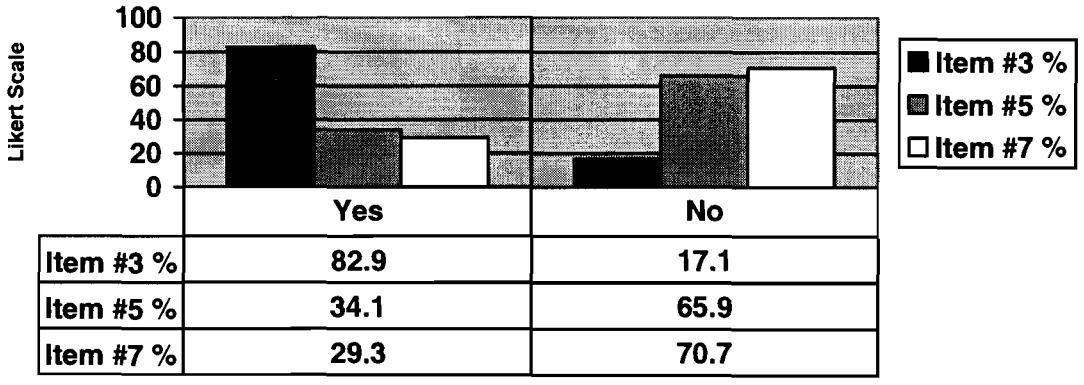


Research Question Number Seven

Do guidance counselors influence student perceptions of construction occupations? Survey items number 3, 5, 7, 11, 12, and 13 were used to analyze the answer to this research question. Items 3, 5, and 7 were yes or no based questions, while items 11-13 used a Likert scale of measurement with the following values: 1 represents strongly disagree; 2 represents mildly disagree; 3 represents agree mildly; and 4 represents strongly agree.

In regards to item number three, which asked the students if they knew what construction-related classes are offered at Appleton East High School, 34 (82.9%) respondents indicated yes and 7 (17.1%) indicated no (See figure 49). In regards to item number five, which asked the students if their guidance counselor has tried to make them aware of the construction-related classes available, 14 (34.1%) respondents indicated yes and 27 (65.9%) indicated no (See figure 49). In regards to item number seven, which asked the students if they were aware that there are 70 different construction-related careers, 12 (29.3%) respondents indicated yes and 29 (70.7%) indicated no (See figure 49).

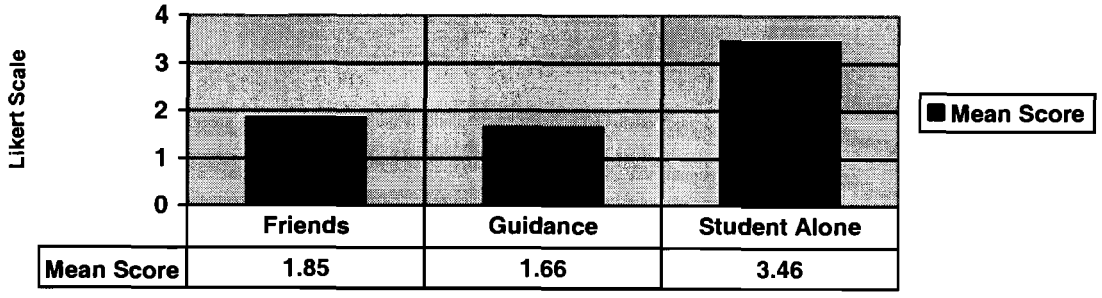
Figure 49: Awareness of Construction-Related Classes Offered



	Yes	No
Item #3 %	82.9	17.1
Item #5 %	34.1	65.9
Item #7 %	29.3	70.7

In regards to item number 11, which states, "my friends opinions influence what Technology Education classes I take," 1 strongly agreed, 10 agreed mildly, 12 disagreed mildly, and 18 strongly disagreed (See figure 52). In regards to item number 12, which states, "My guidance counselor has a major impact on what classes I take," 2 strongly agreed, 5 agreed mildly, 11 disagreed mildly, and 23 strongly disagreed (See figure 52). In regards to item number 13, which states, "I alone made the decisions in choosing my high school courses," 24 strongly agreed, 14 agreed mildly, 1 disagreed mildly, and 2 strongly disagreed (See figure 50).

Figure 50: Strongest Class Choosing Influence



	Friends	Guidance	Student Alone
Mean Score	1.85	1.66	3.46

Chapter V

Summary, Conclusions and Recommendations

Introduction

There are an increasing amount of construction-related occupations available, but there are less Appleton East High School Technology Education students taking an interest in the construction industry to supplement this worker shortage. If CTE instructors and companies within the construction industry fail to develop methods to increase student interest in construction-related occupations, it may cause a further decline in the number of CTE construction-centered programs offered at Appleton East High School, as well as many other CTE programs throughout Wisconsin. The purpose of this study is to determine what factors are influencing Appleton East High School Technology Education students' perception of construction-related occupations.

The literature review revealed that little research has been conducted pertaining to high school students perceptions of the construction industry. Therefore, it is believed that the researcher's summaries, conclusions, and recommendations of this study may be a means to gaining insight in how to positively influence student interest and awareness of construction occupations. This chapter will provide a data summary, conclusion, and recommendation for each of the seven research questions stated in chapter one of this study. The last part of this chapter will include the researcher's recommendations for future studies and the final conclusion.

Research Question Number One

Summary

Is enrollment in construction-related courses a factor that influences student perceptions of construction occupations? The responses of the students who have enrolled vs. those who have not enrolled in a construction-related class, to items 14-22 on the survey, do not reveal striking evidence of a difference in perceptions. The only notable difference in perceptions pertained to item number 21, which stated, "I have never considered working in a construction-related job." Those students who have enrolled in a construction-related class had a mean score of 1.83, while those who have not enrolled in a construction-related class had a mean score of 2.36.

Conclusions

Based on the data acquired, the researcher concludes that in general, enrollment in construction-related classes is not a factor that influences student perceptions of construction occupations. However, the researcher also concludes that students who do enroll in a construction-related course are more likely to consider a career in the construction industry.

Recommendations

Based upon the conclusion, it is recommended that:

1. Construction teachers make a conscious effort to increase enrollment in construction related courses. Even though the data reveals that enrollment was not an influential factor to the respondents of this study, those students who choose not to enroll in a construction-related class will never have the opportunity to learn about the many different careers within the construction industry.

2. Construction teachers provide students with construction relevant literature that pertains to the latest employment trends, hot jobs, and current industry practices. There are many options that are geared towards high school students, such as websites and newsletters to name a few.

Research Question Number Two

Summary

Are student perceptions of construction-related courses influenced by the construction teacher? The data to for this question revealed that the 53.7% of the 41respondents were positively influenced by the construction teacher at Appleton East High School. Though 46.3% were not influenced at all, there were zero respondents who were negatively influenced.

Conclusions

Based on this data provided, the construction teacher at Appleton East High School did have a positive influence on the participating students of this study. Therefore, it can be concluded that the construction teacher can/does impact the perceptions that Appleton East High School Technology Education students hold true regarding construction-related classes.

Recommendations

Based upon the conclusion, it is recommended that:

1. Construction teachers actively self-promote their classes. This can be done through providing stimulating class activities that get students talking and/or promoting construction-related classes through project displays, web sites, posters, or pamphlets.

2. Construction teachers remain current with industry practices to ensure that they do not repeat the same curriculum too often. Repeating curriculum may cause students to lose interest, possibly turning a positive influence into a negative influence. To accomplish this, the teacher

could create a line of communication with local construction companies, trade associations, and local technical colleges.

Research Question Number Three

Summary

Does occupational safety influence student perceptions of construction occupations? The data revealed that 100% of the respondents felt that the construction-related courses at Appleton East High School are safe. However, this perception does not transfer over to construction occupations, because the percentage of students who felt construction occupations offer safe working environments dropped to 70.7%. The researcher analyzed this data with perception items 14-22 by dividing the student responses into safe and unsafe. As a result, there were only two items that indicated a slight difference in perceptions. Data for item 20 revealed that the students who felt construction occupations were safe also strongly disagreed with the statement that construction jobs are below their standards, whereas those who felt construction occupations were unsafe disagreed mildly. Data for item 22 revealed that the students who felt construction occupations were safe also strongly disagreed with the statement that construction jobs are for males only, whereas those who felt construction occupations were unsafe disagreed mildly.

Conclusions

Based on the inconclusive data above, the researcher concludes that safety is not a contributing variable in the perceptions Appleton East High School Technology Education students hold true regarding construction occupations.

Recommendations

Based upon the conclusion, it is recommended that:

1. Construction teachers ensure that construction laboratories offer safe work environments for students.

2. Safety should be made a top priority for students, ensuring that safe working habits will transfer over to their chosen occupation.

3. As a role model, construction teachers should practice the safety standards they teach.

Research Question Number Four

Summary

Do family influences affect student perceptions of construction occupations? Survey data indicated that 65.8% of the participating students had a relative whom worked in the construction industry, while 34.2% did not. Those students who had relatives working in the construction industry strongly disagreed to the statement that construction jobs are below their standards, whereas those students without a relative in the construction industry disagreed mildly. In addition, students with relatives in the construction industry strongly disagreed to the statement that they never considered a career in the construction industry. In contrast, students without relatives in the construction industry agreed mildly to the statement. Lastly, the students who have a relative in the construction industry disagreed mildly with the statement that construction jobs are for males only, whereas the students without relative in the construction industry strongly disagreed.

Conclusions

Based on the data collected there are only three items out of the possible nine in which the perceptions of the students with relatives working in the construction industry vary from the perceptions of those students without relatives in the construction industry. However, these three items do provide enough evidence for the researcher to conclude that family members do affect

Appleton East High School Technology Education students' perceptions of construction occupations.

Recommendations

Based upon the conclusion, it is recommended that those involved in construction education should:

1. Develop an open house night were parents are able to tour the construction facilities with their child. This will provide an opportunity for the parents to ask questions about course content, learn about construction-related careers, and view student projects.

2. Develop brochures for parent teacher conferences that describe the construction-related classes available as well as provide details about the 70 different career opportunities available in the construction industry. Be certain to reach a wider audience, by making the brochures available to all parents who attend.

3. Create a web site specifically designed to inform parents and students about the opportunities that are available in the construction industry.

Research Question Number Five

Summary

Is gender a factor that affects student perceptions of construction occupations? Of the 41 respondents 35 (85.4%) were male and 6 (14.6%) were female. Each gender's responses to the survey perception items 14-22 were relatively close in comparison, but there were a few statements that revealed greater differences. An item which revealed the greatest difference in perception pertained to survey item number 21, which stated, "I have never considered working in a construction-related job." Female students agreed mildly with this statement with a mean score of 3.16, and the male students strongly disagreed with a mean score of 1.77. The last item

of significance dealt with survey item number 22, which stated that, "construction jobs are for males only." Unsurprising to the researcher, the difference between the male (1.97) and female (1.00) means was nearly one full Likert scale point.

Conclusions

Based on the data collected there are only two items out of the possible nine in which the perceptions of the male students varied from the female students. However, these two items do provide enough evidence for the researcher to determine that gender does affect Appleton East High School Technology Education students' perceptions of construction occupations.

Recommendations

In consideration of the conclusion to this research question, construction instructors must make a conscious effort to reverse the perception that the construction industry is for males only. The researcher developed the following recommendations:

1. Display informative posters of both females and males at work in their construction-related career.

2. Create a classroom atmosphere that does not portray or support gender bias discussions or shop talk.

3. Invite a female whom works in the construction industry to be a guest speaker.

Research Question Number Six

Summary

Does grade level influence student perceptions of construction occupations? The percentage of students per grade level who participated in this survey are as follows: 34.1% seniors; 31.7% juniors; 24.4% sophomores; and 9.7% freshmen (See figure 2). To determine the significance of the grade level variable, the researcher analyzed items 14-22 individually.

Individually, the items did not reveal large differences in perceptions; however, there were evident patterns that confirmed a slight difference in opinion.

Items 20 and 21 indicate that more seniors feel construction occupations are below their standards and have never considered a career in the construction industry. In contrast, the senior's response to item 19 indicates that they strongly disagree with the statement that construction jobs are unimportant. These responses appear to be contradictive.

Item 14 reveals that sophomores and juniors don't perceive the construction industry to offer competitive wages as much as the freshmen and seniors do. The sophomores and juniors agreed mildly (mean score of 3.17), while the freshmen and seniors strongly agreed (mean score of 3.59).

The freshmen class responses revealed a pattern in their perceptions of the construction industry as well. For item 21, which stated, "I have never considered working in a construction-related job," the freshmen students had the highest mean total (See figure 47). In relation, the freshmen respondents had the highest mean scores for the items that stated that addition training is not need after high school (See figure 42) and construction jobs are unimportant (See figure 45).

Another form of significance proved evident when the researcher analyzed which two grade levels had the two most negative scores for each statement in items 14-22. The data from items 14-22 indicated that the juniors responded more negatively at a frequency of 33.3%, in comparison to the other grade levels responses. The remaining frequencies of negative responses per grade level are as follows: sophomore students were second at 27.8%; freshmen students were third at 22.2%; and the seniors were least negative at 16.7%.

Conclusions

Based on the data above, the researcher concludes that grade level does indeed influence Appleton East High School Technology Educations students' perceptions of construction occupations.

Recommendations

Based upon the conclusion, it is recommended that:

1. The Appleton Area School District incorporate a required class for incoming freshmen that introduces them to various technology-related career opportunities. This class should cover the four main areas of Technology Education, which include construction, communications, manufacturing, and transportation. In doing so, students would have the opportunity to learn about different technology-related careers and test drive them so they are afforded the opportunity to discover a career path they would like to follow.

2. Students experience multiple field trips to expose them to different occupations within the construction industry. In doing so, students will be able to see first hand what the occupation(s) entails and gain insight into that profession from others who have made that career choice.

Research Question Number Seven

Summary

Do guidance counselors influence student perceptions of construction occupations? Of the 41 respondents for item seven, an alarming 70.7% were not aware of the various occupations available in the construction industry. In addition, item five revealed that only 34.1% of the students indicated that their guidance counselor has tried to make them aware of the

construction-related courses available at Appleton East High School. However, 82.9% of the respondents knew what construction-classes were offered (See figure 49). When decisions need to be made about which classes to enroll in, only 17.1% indicated that their guidance counselor influences their choices. Figure 50 in chapter four of this study reveals that of the three choices allotted in the survey items, the most powerful influence on the respondent's class choices is their own opinion.

Conclusions

According to the data obtained from this study, the researcher concludes that guidance counselors do not influence Appleton East High School Technology Education students' perceptions of construction-related classes or construction occupations. Though the study indicates that guidance counselors did not influence the respondents, no influence can be perceived as negative influence.

Recommendations

Based upon the conclusion, it is recommended that:

1. High School level construction teachers invite guidance counselors to see their class in action. This will afford the guidance counselor the opportunity to fully understand what is being taught through genuine experiences so they do not base their perceptions from the opinions of others.

2. Provide guidance counselors with information regarding construction occupations that students will find exciting or intriguing.

3. Invite a member from the local Associated General Contractors of America chapter to discuss construction industry demands and careers with the entire guidance department.

Conclusions and Recommendations for Further Study

The format of a future study may encompass the influences that were uncovered by this study and elaborate on them by asking students what factors would influence them to consider enrolling in a construction-related course or choose a construction-related career. An opened ended study such as this may be more difficult to conduct, but it may lead to more concrete answers as to why high school students are disinterested in the construction industry.

In all fairness to high school students, the literature discussed in chapter two of this study pointed out that part of the workforce shortage in the construction industry is due to unskilled workers. Therefore, another concept for further study may include determining where these unskilled workers are coming from and determining why they lack the necessary skills to become successful at their chosen construction occupation. This study would be further in depth and would include many more variables, but it may provide better answers as how to alleviate the problems the construction industry is coping with due to the current workforce crisis.

In conclusion, all of the research questions discussed within this study can be summed up with one question; what factors influence student perceptions of construction occupations? The 41 respondents of this study provided a small glimpse as to why Appleton East High School Technology Education students do not perceive construction-related occupations as viable career choices. To summarize, the variables that were concluded by the researcher as being influential included the construction teacher, family members, gender, and grade level. However, theses results represent a small population of Technology Education students at Appleton East High School and may not be true of all Technology Education students.

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Appendix A: Survey

Perceptions of the Construction Industry Survey

Please **do not** write your name on this survey. Before this survey is started, a parent or legal guardian **must** sign a minor consent form. Your participation is strictly **voluntary** and may be discontinued at any time.

Please circle only ONE for each item

1. Please circle your gender: Female Male

2. Circle your current grade level 9 10 11 12

YES NO 3. Do you know what construction-related Technology Education classes are offered here at Appleton East High School?

YES NO 4. In your high school career, have you taken a construction-related Technology Education class?

YES NO 5. Has your guidance counselor tried to make you aware of the construction-related classes available?

YES NO 6. Have you ever considered choosing a career related to the construction industry?

YES NO 7. Are you aware that there are 70 different construction-related careers?

YES NO 8. Has the construction teacher here at Appleton East made a difference in deciding whether or not to take a construction class?

Pos Neg If you answered **YES** to number 8, indicate if the teacher was a positive or negative influence? If you answered **NO** to number 8, go directly to number 9.

YES NO 9. Do you have any relatives who work in the construction industry?

YES NO 10. Do you think that construction classes at Appleton East High School are dangerous?

On a scale of one to four, please circle ONE answer that best describes your response.

1= Strongly Disagree 2= Disagree Mildly

3= Agree Mildly 4= Strongly Agree

SD	DM	AM	SA	
1	2	3	4	11. My friend's opinions influence what Technology Education classes I take.
1	2	3	4	12. My guidance counselor has a major impact on what classes I take.
1	2	3	4	13. I alone made the decisions in choosing my high school courses.
1	2	3	4	14. The construction industry has careers that pay good wages/money.
1	2	3	4	15. Construction-related careers offer safe working environments.
1	2	3	4	16. I do not need any additional training after high school to work in the construction industry.
1	2	3	4	17. The construction industry is an important part of the United States economy.
1	2	3	4	18. There are very few jobs available in the construction industry.
1	2	3	4	19. Construction jobs are unimportant.
1	2	3	4	20. Construction jobs are not good enough for me
1	2	3	4	21. I have never considered working in a construction-related job.
1	2	3	4	22. Construction jobs are for males only.

Appendix B: Consent Form

Consent to Participate in UW-Stout Approved Research

Title: An analysis of the influences on Appleton East High School Technology Education students' perception of the construction industry

Investigator: Steve Masanz
Appleton East High School
Office: Room 193
920-997-1399 ext 2769

Advisor: Michael Galloy
UW-Stout
225P Applied Arts Building
715-232-2108

Description:
The purpose of this study is to determine what factors are influencing Appleton East High School Technology Education students' perceptions of construction-related occupations. Data will be collected from Appleton East High School students through the use of voluntary surveys during the spring of 2006.

Risks and Benefits:
Due to the nature of this study, there are minimal risks to the students who agree to participate in this study. To minimize all risks, participants will be made aware that the survey is strictly voluntary and they may discontinue their participation at any time. As a result of students participating in this study, teachers and construction industry members may better understand the how to effectively market construction occupations to high school students. In return, a greater amount of high school students will be able to explore career options related to the construction industry.

Special Populations:
Appleton East High School Technology Education students will be the only population providing data for this study. Therefore, the researcher must obtain permission from the student's legal guardian(s) before any surveys can be completed by participating students.

Time Commitment and Promotional Items:
The survey instrument will be administered to the students by their instructor on a regular schedule day during their class period. Each period is 55 minutes in length and the students will have the option of using the entire class hour to complete the survey. After completion, the student will return the survey to the instructor and will then be allowed to work on course work for the remainder of the class period.

The investigator plans to randomly select five students, who chose to complete the survey, to receive a $10.00 movie gift certificate to a local movie store or theatre. The survey participants will be clearly informed that in no manner will their responses to the survey affect the outcome of those who receives the movie certificates.

Confidentiality:
The instructor who proctors the survey will know who participated, but they will not know each individuals responses. To help ensure confidentiality the survey instrument will not contain names, test numbers, color coding, or hand writing. In addition, only the survey results will be revealed to the readers of this study. There is no way for the reader to determine who actually participated. Completed surveys will be kept in the researcher's locked desk until the research is completed and then shredded in the office shredder. No one will have access to the names of the particpants except for the researcher and the researcher's advisor.

Right to Withdraw:
Student participation in this study is entirely voluntary. Students may choose not to partcipate without any adverse consequences to you. Should a student choose to participate and later wish to withdraw from the study, they may discontinue their participation at this time without incurring adverse consequences.

IRB Approval:
This study has been reviewed and approved by The University of Wisconsin-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study please contact the Investigator or Advisor. If you have any questions, concerns, or reports regarding your rights as a research subject, please contact the IRB Administrator.

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Statement of Consent:
By signing this consent form you agree to participate in the project entitled, "an analysis of the influences on Appleton East High School Technology Education students' perception of the construction industry."

Student Signature:

_____ Date: _____

Signature of Parent or Guardian:

_____ Date: _____